NATIONAL CAR BUILDER

VOLUME XIV. NUMBER 9

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

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SEPTEMBER, 1883.

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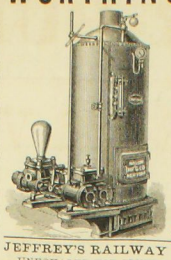

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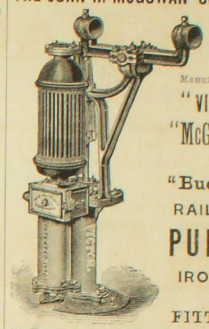

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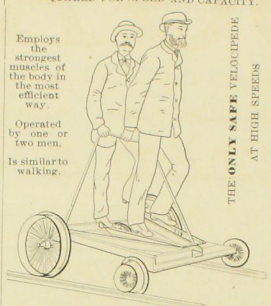

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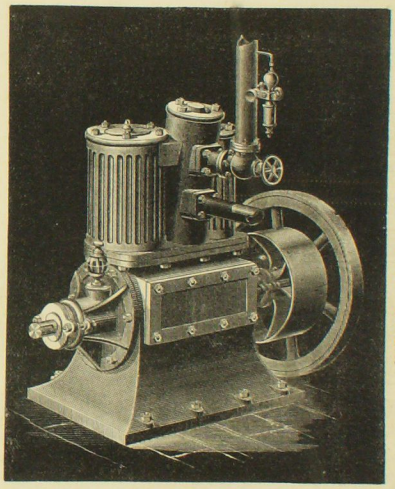

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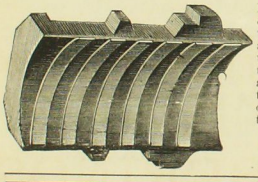

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Pennsylvania Railway Co.'s Standard 20-ton Bolster Spring.

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Stock for Head Linings, etc., and all other desirable woods for CAR BUILDING purposes. Reasonable prices. Sample order solicited.

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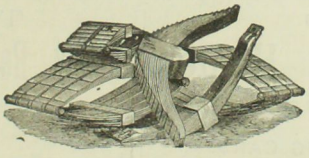
EXTRA TEMPERED,  LIGHT ELLIPTIC

CRUCIBLE CAST-STEEL SPRINGS,

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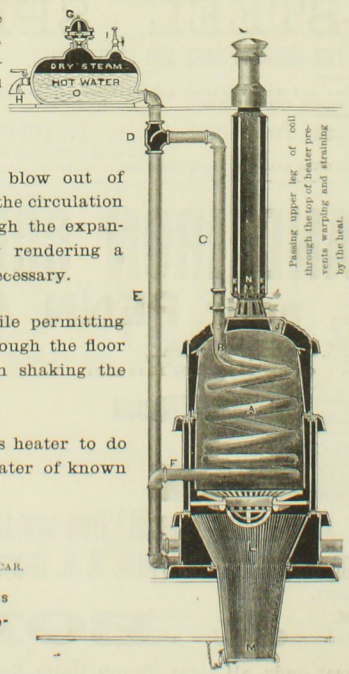
When the fire is low the pipes may be refilled through the funnel cock, without requiring the pipes to be cooled off.



Salt Brine cannot blow out of this heater, because the circulation does not pass through the expansion drum, thereby rendering a pressure gauge unnecessary.

No dust arises while permitting the ashes to pass through the floor of the car, or when shaking the grate.

We guarantee this heater to do all that any car-heater of known repute will do.

For Full Particulars Please Send For Descriptive Circular.

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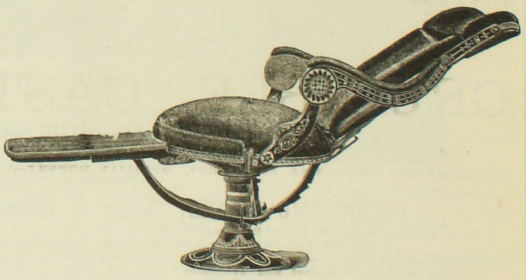
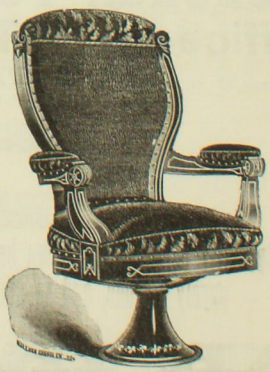
Hartley Reclining and Revolving Chair.



HEAD REST DOWN.



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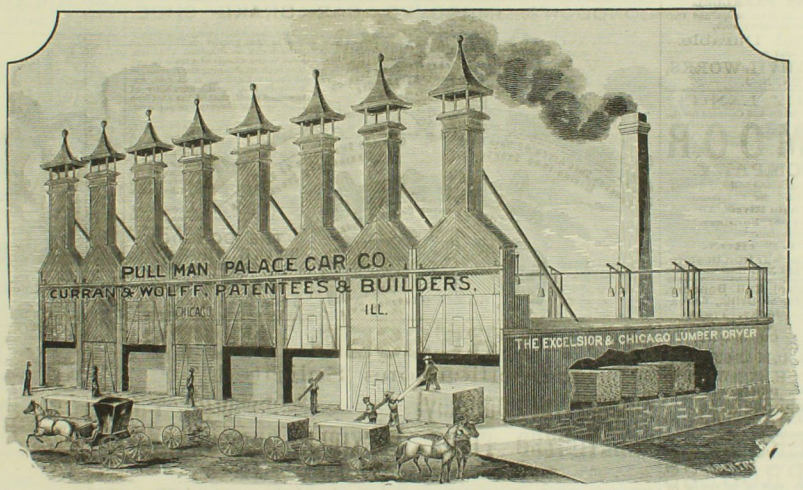
PAYS FOR ITSELF EVERY YEAR. Storing Capacity, 40,000 Feet Inch Lumber.



DRYING 8,000 FEET PINE LUMBER EVERY 24 HOURS.

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C. & N. W. R. R. Co., Chicago	2
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C., B. & Q. R. R. Co., Aurora, Ill	2
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WELLS & FRENCH CO., BRIDGE AND CAR-BUILDERS, CHICAGO, Nov. 13, 1880.

Messrs. Curran & Wolff, City:

GENTLEMEN: In reply to your favor inquiring as to the two Dry Kilns you built for us two years ago, we take pleasure in saying that they have given us entire satisfaction.

We are drying upward of ten thousand feet of inch boards in each Kiln every twenty-four hours, and the lumber comes out of the Kilns free from checks or damage of any kind resulting from the process.

We have concluded to build another of your Dry Kilns, finding them indispensable in our business, and we do not see how any one doing business requiring a large amount of lumber can get along economically without them.

Yours truly,
THE WELLS & FRENCH CO.
H. L. NORTON, Sec. and Treas.

CURRAN & WOLFF, Proprietors and Builders, 39 and 41 FRANKLIN STREET, CHICAGO, ILL.

THE COWELL PLATFORM

Is the only device making A CONTINUOUS FLOOR between cars in motion.

IT ABOLISHES JERKING AND JOLTING, AND RUNS CARS STEADIER THAN ANYTHING AND EVERYTHING ELSE KNOWN.

We refer to the Flint & Pere Marquette R. R., which recently fully adopted our device, and to the following:

NEW YORK & GREENWOOD LAKE RAILWAY, SUPERINTENDENT'S OFFICE, JERSEY CITY, May 22, 1882.

ROBERT HARRIS, Esq., *Vice Pres't N. Y., L. E. & W. Ry.:*

In accordance with instructions contained in your letter of April 4th, I delivered one combination car and two coaches to the Cowell Platform Company, which they promptly equipped with their patent buffer, since which time the cars have been in constant service.

On Friday, May 19th, the buffers were subjected to a severe test in the presence of several prominent railway officials, and performed all and more than the Cowell Company claimed for them. Matches and toothpicks were placed between the buffers, in order to see if in starting or stopping the buffers would separate enough to let an article so small pass between them. In all these tests the tension kept up to its work and made the platforms continuous. There was no perceptible jerk when starting, and several times a high rate of speed was reached when the engine was reversed, the air applied and a danger stop made without any jar or unpleasant sensation felt other than in making an ordinary station stop. I feel justified in saying, I believe the Cowell Buffer to be a great improvement over any other device I have seen, and should be pleased to have the coaches of the Greenwood Lake Railway Company equipped with this device; believing the saving in the end would justify the expense. J. H. TUSKEY, *Acting Supt.*

L. S. & M. S. RY., SUPERINTENDENT'S OFFICE, EASTERN DIVISION, CHAS. B. COUCH, SUP'T. CLEVELAND, O., April 7, 1882.

J. F. HERRICK, Esq., *Sec'y and Treas. Cowell Platform and Coupling Co., Cleveland, O.:*

DEAR SIR:—Having witnessed the exhibition of the "Cowell Platform and Buffer," at Cincinnati, March 22d, 1882, will say that in my opinion it is an excellent device. It is a safe and convenient Buffer, keeping the train very steady while in motion, especially over track of uneven surface and curves, there being no "lost motion" between the cars, which prevents the jolting and jarring occasioned by starting and stopping trains, as with the ordinary platform, thus saving much annoyance to passengers.

Yours truly, CHAS. B. COUCH.

S. L. Bell, Conductor on the Western & Atlantic R. R. says: "For two years I have been running a train of cars with your appliance, and I consider it the most practical and the most perfect device in use. It runs a train of cars steadier. I think, if properly managed, it will be a great saving to railroads, and I know affords much more comfort to the traveling public."

For further particulars address
W. STAGER, Gen. Manager.

G. R. Carr, General Superintendent Columbus, Hocking Valley & Toledo R. R., says: "We prefer it to any in use that I have seen."

R. A. COWELL, Esq.: MEADVILLE, PA., June 7, 1881.

DEAR SIR:—In reply to your inquiry as to my opinion of your platform, I think it the best in use, and I have seen nearly all of the improvements on railroads as I have been in the transportation department for twenty-two years. I have been running a train on the N. Y., P. & O. R.R., equipped with your platform, for the past nine months, and I can see no wear as yet. I think it will last as long as the car itself. They certainly can be run at a higher rate of speed with greater safety than any other in use. It prevents that rolling motion at the ends of the coaches; it also prevents the jerking of the train in stopping and starting, which is so unpleasant. In fact, I cannot say too much in its favor. There are a great many good things about it that I have not time or space to mention.

Very truly yours, J. W. BABCOCK,
Conductor N. Y., P. & O. R. R.

J. W. Thomas, General Superintendent Nashville, Chattanooga & St. Louis Railway, says: "A train of two coaches and a baggage car, equipped with your Continuous Platform and Coupler, has now been in service on our road for over a year, running in our accommodation train 110 miles per day, and has given entire satisfaction, costing nothing for repairs during that time."

J. G. Sawyer, Master Car-Builder of the same road, says: "I have been using your Continuous Platform and Drawhead in three of our cars on the N. C. & St. Louis road for the past ten months. They work in every way to our satisfaction. In that time they have cost the company neither trouble nor expense. I believe them to be a first-rate Platform and Drawhead."

B. Y. HOLT, *Conductor.* J. G. SAWYER, *M. C. B.*

R. F. Smith, General Manager Cleveland & Pittsburgh R. R., says: "Your devices have given us entire satisfaction, having proved thoroughly efficient in accomplishing all the objects intended, and with marked economy as to maintenance."

Hiram Fowler, Superintendent Connecticut Valley R. R., says: "The Cowell Patent Platform has given perfect satisfaction."

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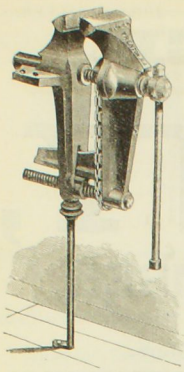

Our NO. 6 VISE opens 10 inches, with 8-inch Jaws; has solid forged screws 1¾ inch diameter, with 36-inch lever. We make 5 smaller sizes of same pattern. Special discounts to R. R. Companies and Car Companies on application.

THE
FISHER DOUBLE-SCREW VISE.
FULLY WARRANTED.

Stronger than any other Leg Vise,
AND ALWAYS PARALLEL.

The Best Vise for R. R. Machine Shops and Car-Builders, and for all heavy work.

Accurate and Durable.

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TRENTON, N. J.

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Sole Agent in the United States and Canadas for the
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Bar Iron of great strength and uniform quality **Plate Iron** unequaled for Fire Boxes. **Tyres, Axles, Chain Rivets, Angle** and **T Iron** and **Forgings** of all descriptions.

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STEEL RAIL BENDER

Steel Rail Benders, Track Drills, Track Jacks, Track Wrenches, Car Movers,

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A GREAT IMPROVEMENT.
Ketcham's Positive Ferro-Prussiate, or
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paper gives dark blue lines on a white background on first impression, instead of white lines on blue background, as in the ordinary blue process paper, thus making the *altering* of lines or the *coloring* of any part of the drawing perfectly simple and easy. Prices: in rolls of 11 yards in length by 30 in. wide, $4; 36 in., $5; 43 in., $6 per roll.

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Solar Printing and Blue Process Paper.
White and Manilla Drawing Paper in Sheets, Rolls or Mounted.
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Railroad Printers and Stationers,
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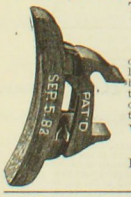
Light, Strong, Simple, Durable.



The Best and CHEAPEST IN USE.

Both Head and Shoe quickly adjustible, the latter also easily reversible when required. All the corresponding parts of each thoroughly interchangeable.

Write for circular and Prices.

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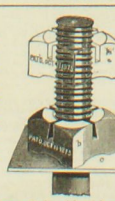

J. W. LARABEE, Treasurer.

a, ATWOOD NUT on bolt without bearing on base slots open.
b, ATWOOD NUT turned to bearing c partially closing the slots and grasping the bolt.

MORSE TWIST DRILL AND MACHINE COMPANY

MANUFACTURES
Patent Twist Drills, Machine Bits for Wood, Bit Stock Drills, Reamers, Standard Gauges, Milling Cutter and Special Tools, for use in Railroad, Car and Locomotive Shops. **NEW BEDFORD, Mass.**

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SOLE MANUFACTURERS OF
HARD & FLEXIBLE VULCANIZED FIBRE.

Flexible Vulcanized Fibre Dust Guards and Oil-Box Covers,

being absolutely unaffected by oil or heat, are far more durable and efficient than Leather, and much cheaper.

Office and Works; Wilmington, Del.

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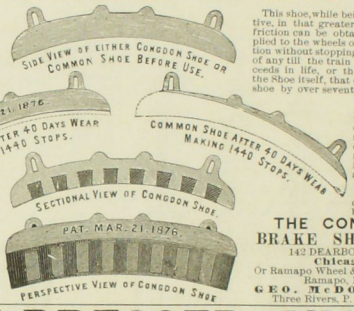
19 William Street, New York.

H. HOWARD, Pres. F. KUHNE, Treas. W. K. JEWETT, Sec'y.

CONGDON'S IMPROVED CAR BRAKE SHOE.



This shoe, while being more effective, in that greater uniformity of friction can be obtained when applied to the wheels of a train in motion without stopping the revolution of any till the train is at rest, exceeds in life, or the durability of the Shoe itself, that of the cast iron shoe by over seventy-five per cent.

Its durability, together with cheapness and simplicity of consruction, recommend it in preference to any other in use

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142 DEARBORN ST., **Chicago,**
Or Ramapo Wheel & Foundry Co., Ramapo, N. Y.
GEO. McDOUGALL,
Three Rivers, P. Q., Canada.

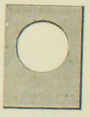
HOT PRESSED NUTS.
Specifications Solicited.
Empire Nut Company, Pittsburgh, Pa.

GELATINIZED FIBRE FLEXIBLE DUST-GUARDS.

Superior to Leather or "Vulcanized Fibre."

Keep the Oil in the Car-Boxes and Sand and Dust out of Them

They are not affected by oil, grease or petroleum; do not cut the axles, as grit does not adhere to them; keep their shape well and will outwear several leather ones. Cut to order of any desired thickness or pattern. Send drawing or sample for estimate. This material is **absolutely free from grit, and will not become brittle and break.**



NOW IN USE ON MANY LEADING RAILROADS, GIVING GENERAL SATISFACTION.

Master Car-Builders desiring to cut their own washers can be furnished with FLEXIBLE SHEET GOODS of any desired thickness; being uniform in quality and thickness, can be cut without waste.

BE SURE TO SEND FOR SAMPLES AND PRICES.

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SOLE AGENTS,
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STEAM PUMPS

For Boiler Feeding and Fire Protection a Specialty.

THE IMPROVED DAYTON CAM PUMP,
Designed and built especially for BOILER FEEDING and for PUMPING HOT WATER.

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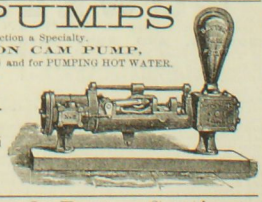
For Railroad Purposes.
The Combined Pump and Boiler, with Removable Water Cylinder.



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Manganese Bronze and Brass Castings,
STRONGEST AND BEST IN MARKET.

FOR ROLL NECK CAR JOURNAL AND MACHINERY BEARINGS,

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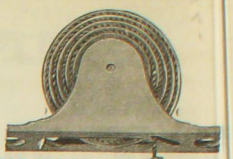

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For Passenger Coaches, Sleep ing and Pri Car Windows, consisting of Cone and Coil Spr with wire cord, balancing the weight of sash; noise in operation and placed entirely out of sight. Ado by many of the leading roads. No car complete with them.

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IMPORTER AND DEALER IN
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Portable Forge.

All sizes, for the lightest the heaviest work, run Chain Gear and Flat Belt Strong Blast and durabl For sale by

Keystone Portable Forge Co. 204 North Fourth St.,

Patent Combination Ratchet Drill

The most durable Ratchet in market has extra sleeve attachment. Price very low. A large stock constantly on hand.

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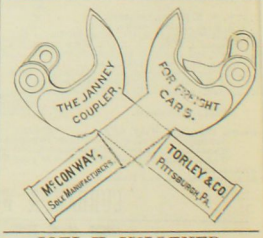

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Ties, spring delivery, Lake Erie and Ontario Ports.

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NORTH CAROLINA CAR COMPANY,

Standard and Narrow-Gauge Freight Cars.
RALEIGH, N. C.

GILL CAR M'F'G CO.,
Columbus, Ohio.
Make the best CARS and WHEELS.

(THE BEST LUBRICATOR FOR JOURNALS OR BEARINGS MADE.)

CHALLENGE COACH GREASE

—AND—

HOT-BOX COMPOUND.

Guaranteed to run a car 5,000 miles with one greasing. We will furnish sufficient grease to make a thorough trial, and make no charge for same unless it gives absolute satisfaction.

CHICAGO, February 9, 1883.

W. S. CALHOUN & Co., CHICAGO—

DEAR SIRS: The following is a report of test made with "Challenge Coach Grease," under passenger coach No. 69 up to date: Car made 8,200 miles the first greasing (one box hot); removed journal bearing; applied more grease to the seven other bearings, and continued the test until car had made 20,600 miles. Average reduction by friction, 8 oz. per bearing; average mileage to 1 oz. of reduction, 2,575 miles. Amount of grease used since being packed, 4 oz. to each box or two applications, or 8 oz. to each box in all during test.

Yours truly,
A. J. BIRD, Foreman Passenger Depot,
C., R. I. & P. Railway.

I certify that the above report is correct,
R. H. CHAMBERLAIN, Div. Supt. Illinois Div.

Approved:
B. K. VERBRYCK, M. C. B.,
C., R. I. & P. Railway.

GRAND RAPIDS, March 6, 1883.

W. S. CALHOUN & Co., CHICAGO—

DEAR SIRS: Referring to your "Challenge Coach Grease," for railway coaches, I have this to say: that, after a thorough trial, I find it far superior, in every respect, to any grease we have yet used. The journals of the coach that were packed with your grease on December 9 last, on examintion to-day look as well as when first filled. Said coach has run 180 miles every day since journals were filled, viz., Dec. 9. I am perfectly satisfied that the "Challenge Coach Grease" will do all that is claimed for it, and have recommended its use on all our coaches.

Respectfully yours,
MAT. SCHOOF, Car Examiner,
For Chicago & West Michigan Railroad.

Price, 45 Cents per Gallon, f. o. b. Chicago. Address

W. S. CALHOUN & CO.,

Manufacturers and Jobbers of Oil and Waste, and Sole Agents for CHALLENGE COACH GREASE,

Correspondence solicited. 165 Jackson Street, Chicago, Ill.

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RAILWAY TRAIN POWER BRAKES

BEST IN THE WORLD.

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THE EAMES BRAKE is confidently offered as the most efficient, simple durable and the cheapest power Brake in the market. Can be seen in operation upon over 120 roads, and notably the N. Y. Elevated R. R., where it daily makes 69,277 stops.

ARE PREPARED TO SUPPLY AT LOW RATES BEST QUALITY. PHOSPHOR BRONZE CAR AND ENGINE BEARINGS.

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SUCCESSORS TO GEORGE K. TRYON SON & CO PHILADELPHIA.

MEDAL AWARDED CENTENNIAL EXPOSITION 1876 FOR SUPERIOR QUALITY PHOSPHOR BRONZE CASTINGS

HALE & KILBURN MANUFACTURING COMP'Y,

48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,

LASTIC SLAT SEAT.

RATTAN SPRING SEAT.

REFERENCES.
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AND ONE HUNDRED OTHERS.

EXTENSIVE MAKERS OF

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ESTIMATES, CIRCULARS AND SAMPLES FURNISHED ON APPLICATION.

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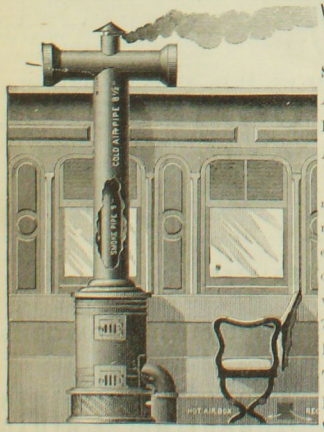
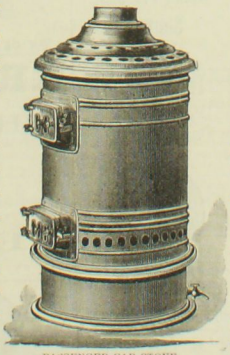
WINSLOW'S IMPROVED SAFETY CAR HEATER AND VENTILATOR.



A PERFECT SAFEGUARD AGAINST FIRE IN CASE OF ACCIDENT.

The Strongest and most Durable Stove made. The most economical, on account of the very large volume of air heated. Their use insures HEALTH, SAFETY AND COMFORT.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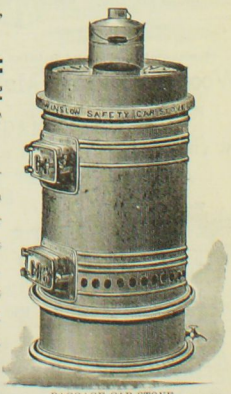
For BAGGAGE, MAIL, EXPRESS, CABOOSE AND EMIGRANT CARS.

With Flat Top, arranged for trainmen to warm their dinner pails on, and Jacket made of No. 16 irons, so that they will not jam by baggage or mail coming in contact with them.



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WINSLOW SAFETY CAR STOVE CO., Cleveland, O.

CLEVELAND, COLUMBUS, CINCINNATI & INDIANAPOLIS RAILWAY.

Evening trains leave CLEVELAND daily with Rotunda Sleeping Cars for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE, TERRE HAUTE, EVANSVILLE, ST. LOUIS and all points West and South. Morning trains leave Daily, except Sunday, with Through Palace Coaches, for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE, and ST. LOUIS without change. This is the only line making direct communication with all the Principal Trunk Lines of the East for NASHVILLE, MEMPHIS, NEW ORLEANS and all points in Texas, either by way of LOUISVILLE or ST. LOUIS. Direct connection at ST. LOUIS for all Railway Towns in Kansas, Nebraska and Colorado.

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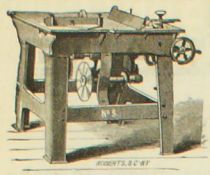
E. B. THOMAS, General Manager. A. J. SMITH, General Ticket Agent.

CLEVELAND TWIST DRILL CO., { 24 & 26 West Street, Cleveland, O. 101 Chambers Street, New York.



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Wardwell Saw Benches a specialty.

These machines are in use in the car-shops of the Penn. R. R. R. & O., P. W. & B. R. & A. F. R., Mich. Central, and some fifty other of the largest shops in the country.

Also, A HEAVY BAND SAW FOR CAR WORK.

ROTARY, STATIONARY, BED & BUZZ PLANERS

And a large number of other machines for car work.

We are dealers in all kinds of Second-Hand Machinery, Engines, Boilers, Iron and Wood-Working Machinery.

No. 3 Wardwell Saw Bench.

Do not buy until you send for new descriptive list, stating just what you want enclosing stamp.

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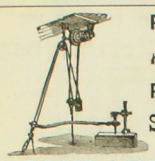

PORTABLE Machines for Use by Bridge, Engine and Boiler Makers.

PORTABLE Drilling, Tapping, Boring, and Reaming Machines

PORTABLE Machines for Wood Boring, Polishing, and Emery Wheel Grinding.

STOW FLEXIBLE SHAFT Co., Limited,

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HAND CARS, PUSH CARS, MINE CARS,

RAILROAD AND MINE SUPPLIES,

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ALSO SOLE MANUFACTURER UNDER LETTERS PATENT OF THE

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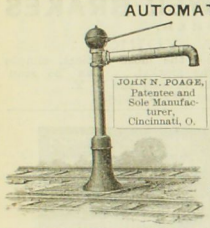
AUTOMATIC WATER COLUMN.



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"1882. STANDARD."

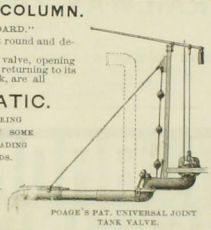
The Fireman draws it round and depresses the lever.

The acts of closing valve, opening and closing waste, and returning to its position parallel to track, are all

AUTOMATIC.

AND ARE BEING ADOPTED BY SOME OF THE LEADING RAILROADS.

INFRINGEMENTS ARE BEING PROSECUTED.



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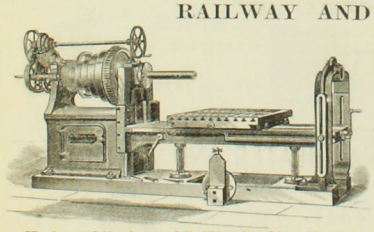
MAKERS OF

HEAVY MACHINE TOOLS

FOR USE IN

RAILWAY AND CAR SHOPS.



Horizontal Boring and Drilling Machine, No. 2.

Radial Drills,
Engine Lathes,
Wheel Borers,
Wheel Lathes,
Wheel Presses,
Slotters
Planers.

Wood Working Machinery and Iron Tools.

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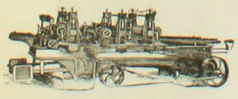
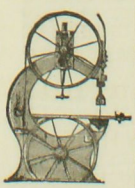
WAREROOMS: 172 HIGH STREET, BOSTON.

91 LIBERTY STREET, NEW YORK.



61 SOUTH CANAL ST.,

CHICAGO.



Special Machinery for the use of Car-Builders and R. R. Shops.

DENISON'S

Patent Cooling and Lubricating Compound,

For Cooling Hot Journals. We would especially call the attention of Railroad Men to this compound, as it will immediately Cool a Hot Journal while the Cars are in Motion, and no Journal will heat where the box is packed with it. None genuine without this Trade Mark.

DIRECTIONS.—For Cars and Engines, pack the Box so that the Compound will come in contact with the Bearings and Journals, using waste saturated with oil.

Address letters and orders to

E. A GODDARD & Co., Agents,

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STEEL CASTINGS

FROM 1-4 To 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for locomotives, etc. 15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over other steel castings. CRANK SHAFTS, CROSS-HEADS and GEARING specialties. Circulars and Price Lists free.

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Works: CHESTER, Pa. 407 Library St., PHILADELPHIA.

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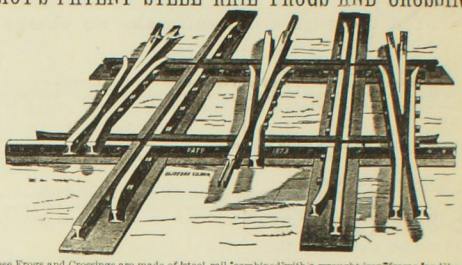
ELLIOT'S PATENT STEEL RAIL FROGS AND CROSSINGS.



These Frogs and Crossings are made of steel rail, combined with a wrought-iron frame, and bound together transversely with strong bolts, which gives them great strength and durability without destroying their elasticity. They are connected at all ends by Fish-Plate Joints, and lie on the same tie surface as the running rail without any cutting of ties, thus saving a great deal of time and labor in putting in place on track.

Manufactured by H. & H. ELLIOT,

East St. Louis, Ill.

WM. B. BEMENT & SON, Philadelphia,

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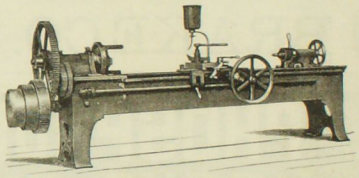

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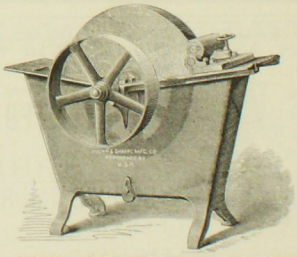

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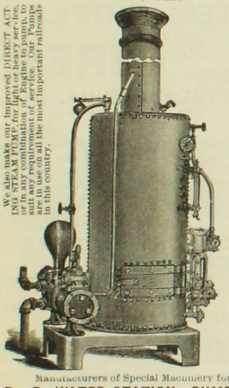

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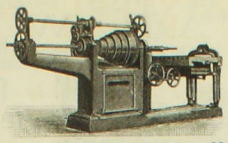

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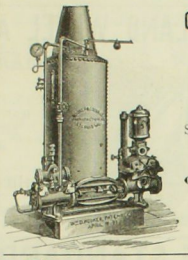

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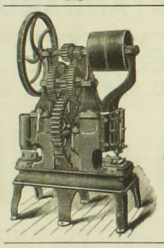

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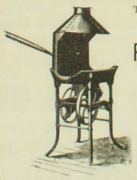

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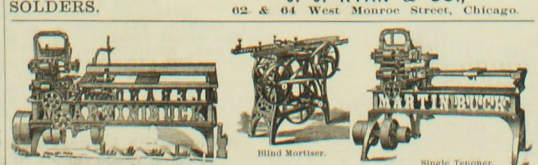

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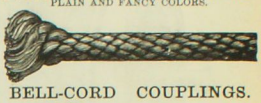

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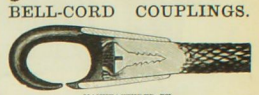

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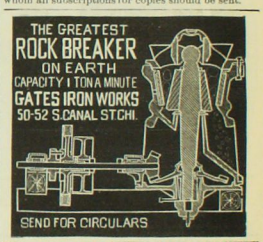

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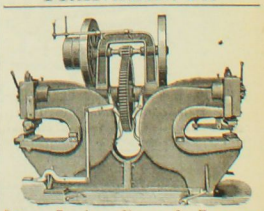

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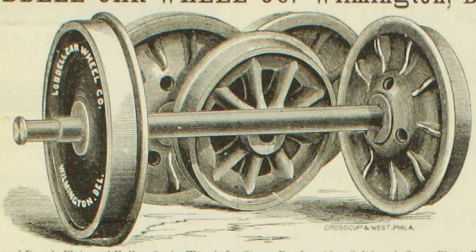

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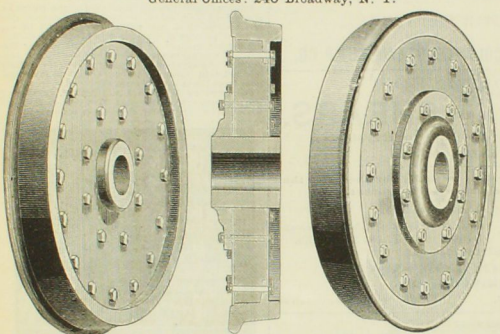

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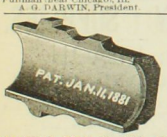

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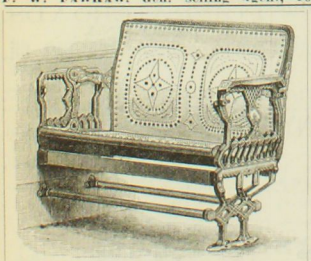

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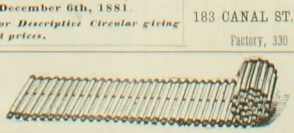

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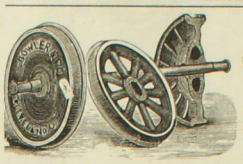

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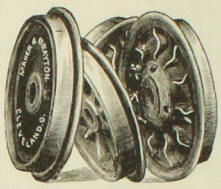

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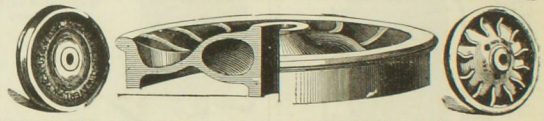

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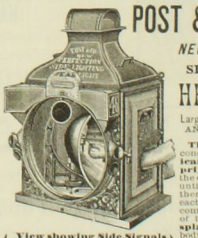

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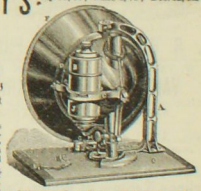

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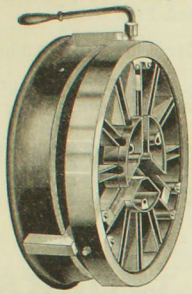

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This cut represents the Horton Car Wheel Chuck holding a car wheel in proper position for boring, the flange and tread of the wheel assuming a true position on the jaws.

CAYUTA CHILLED CHARCOAL WHEEL

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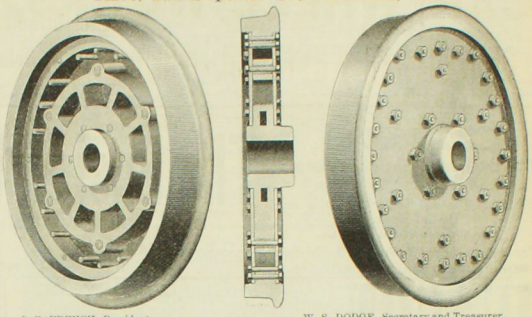

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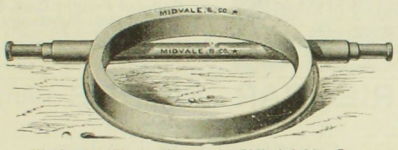

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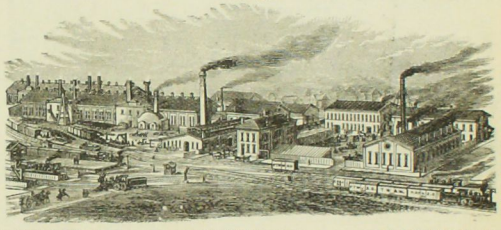

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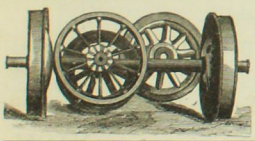

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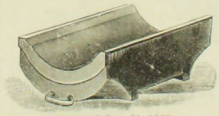

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CASTINGS FOR RAILROAD PURPOSES.

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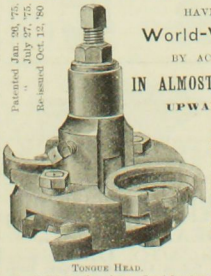

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UPWARDS OF 9,000 SOLD.
The bits arranged in upper and lower series are secured to seats alternately inclined for the purpose of giving clearance to their cutting points—a feature peculiar to this head and the strong hold of its claim to public favor. Positively the lightest, strongest and most durable matching head in the world. Warranted to work the hardest cross-grained lumber with the greatest ease, and not chip up the edges. Send for descriptive circular.
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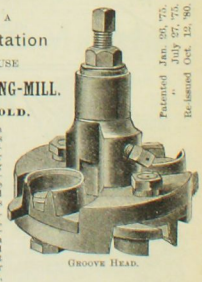

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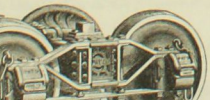

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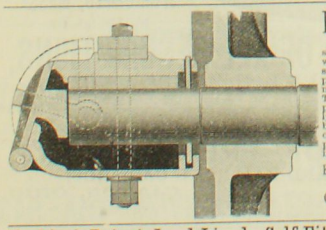
We respectfully refer you to the following railroads using this Truck: B. & D.; K. C., St. J. & C. B.; M. R., F. S. & G.; C., B. & Q.; C. A. & St. L.; A., T. & S. F.; A. & N.; K. P., F. & P. M.; M. C.; St. L. I. M. & S.; B. & M. R. (in Neb.); D. F.; L. L. & G.; C. V.; S. C.; Baldwin Locomotive Works.



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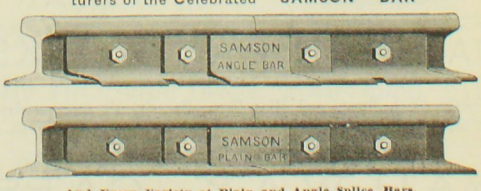

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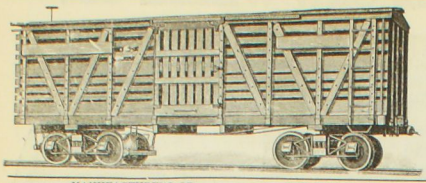

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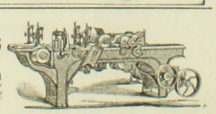

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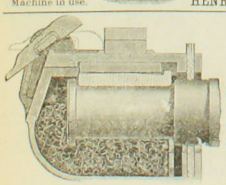

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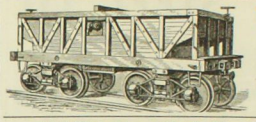

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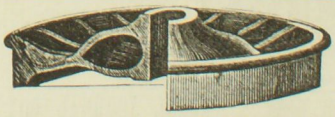

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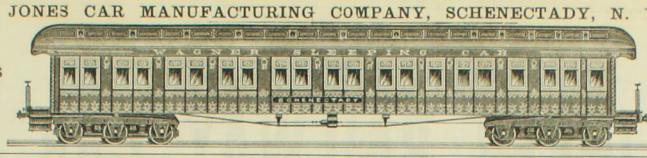

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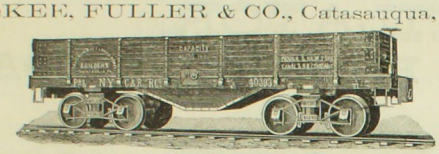

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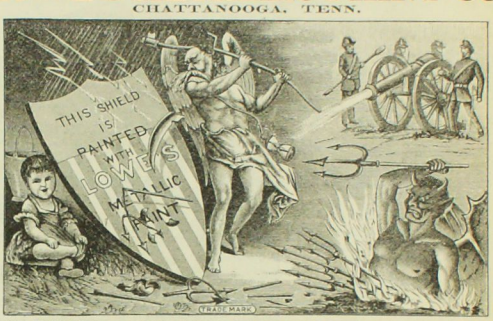

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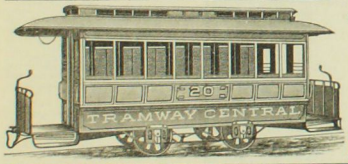

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BUILDERS OF
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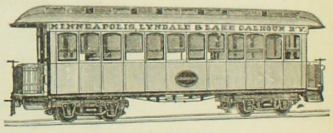

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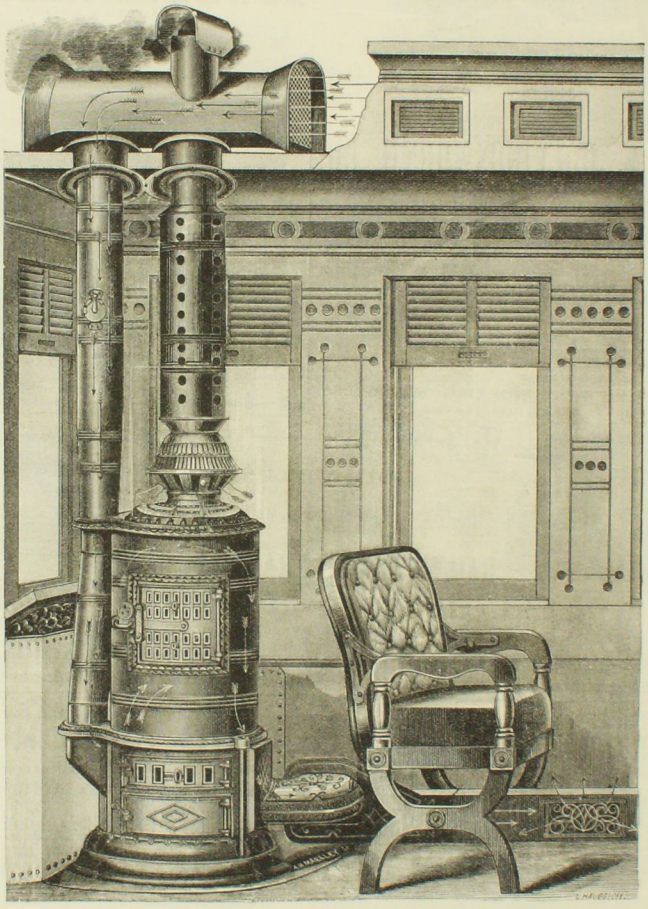
IMPROVED
ANTI-CLINKER RAILWAY CAR HEATER
AND VENTILATOR,
FOR ANTHRACITE OR BITUMINOUS COAL.



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An Important Feature about our Heaters is the PATENT ANTI-CLINKER GRATE.

The object of this invention is to **REMOVE THE ASHES AND CLINKERS FROM THE FIRE-POT WITHOUT DROPPING THE FIRE OUT**, and a **CONTINUOUS FIRE** can be kept going. By this means the entire surface of the Stove can be relied on for heat, and the base of the Stove is always hot. In this Stove we give a **BOTTOM AS WELL AS A TOP VIEW OF THE FIRE**, and **WE CAN SEE** when the fire requires raking.

We can furnish with this Heater our new REGULATING DRAFT REGISTER, which is placed on the top of the Stove in the smoke-pipe, and affords perfect control of the fire, thereby economizing the consumption of fuel, prevents the Stove from becoming over-heated, and regulates the temperature of the car in mild weather, and aids to its ventilation.

We invite special attention to the above cut, which illustrates our improved Anti-Clinker Car Heater and Ventilator. Many devices have been tried for heating and ventilating railway cars, and most of them have proved failures; but, by our improved plan, cars can be thoroughly heated and ventilated. The fresh air is taken in at the top of the car through the ventilator, passing down a pipe to the base of the stove, around the heated cylinder, and through a 4 × 6 tin pipe along the side of the car, escaping through registers between the seats, thus warming the feet of passengers, thoroughly heating the car, and forcing the foul air out through the top openings. In making attachment from heater to tin pipe, we use a cast-iron elbow, which makes a complete connection between the heater and hot-air pipes. Persons who travel in railway cars know how uncomfortably hot the seats are near the stove, and how often they are obliged to raise the windows, to the annoyance of passengers at a distance from the stove, who are suffering from the cold; and also how ILL VENTILATED most cars are, on account of the air in the car coming in contact with the heated plates of the stove.

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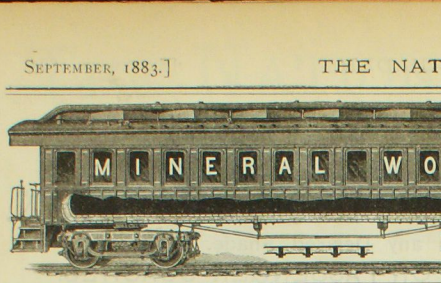

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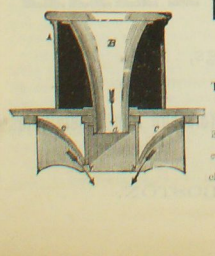

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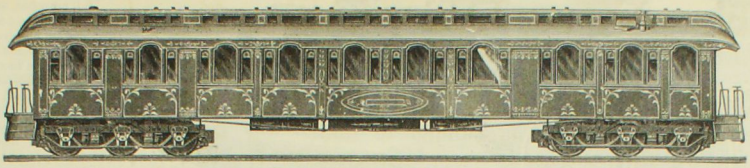

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VOLUME XIV NUMBER 9. | SEPTEMBER, 1883. | SINGLE NUMBERS, TEN CENTS. $1.00 PER ANNUM.

Miscellaneous Items.

THUS far 3,729 miles of road have been completed in Mexico. Four of them are narrow-gauge.

THE Toronto, Grey & Bruce Railroad has been leased for 999 years to the Toronto & Quebec Railroad Company.

THE Gilbert Car Manufacturing Co. in Troy, N. Y., is building 10 new passenger cars for the New York & New England road.

J. G. BRILL & Co. in Philadelphia have completed an order for 10 passenger cars for the New York & New England road.

THE French Spiral Steel Spring Company is building extensive new works in Pittsburg. The new building is 309 × 75 feet.

MR. JAMES COOKE, President of the Cooke Locomotive Works, at Paterson, N. J., died Aug. 2, aged 46 years. He was widely known as a locomotive builder of experience and capacity.

THE Gilbert Car Manufacturing Company, Troy, N. Y., have received an order for two palace cars from the government of New South Wales. They will be used on the line from Sidney to Melbourne.

JOHN BARNETT, the first railroad conductor ever employed in passenger traffic, died lately in England. He accompanied the old No. 1 engine in its trial trip with George Stephenson.

THE Canadian Locomotive Works at Kingston, Ontario, have lately taken a contract to construct seven passenger locomotives for the Intercolonial Railway. The engines will have 18 × 24-inch cylinders and 5-foot 9-inch drivers.

MR. LLOYD CHAMBERLAIN, Treasurer and Purchasing Agent of the Lehigh Valley Railroad, died at his residence in Camden, N. J., July 7, aged 76 years. He was a civil engineer by profession, and had been connected with the road for the past 41 years.

IT is reported that the Cincinnati, New Orleans & Texas road is to have a large number of freight cars built by the Pullman Co., and the Wason Car and Foundry Co., the former company getting 1,000 and the latter a smaller number.

THE Michigan Car Co. has just taken contracts to build 500 box cars for the Chicago, Milwaukee & St. Paul and 250 coal cars for the Wheeling & Lake Erie road. The company is also building a number of Tiffany refrigerator cars.

THE shops of the United States Rolling Stock Co. in Chicago (excepting the paint shop) were destroyed by fire Aug. 15. A large quantity of rolling stock was also consumed. It is said that the losses are mostly covered by insurance.

AT the shops of the Richmond & Danville road, in Richmond, Va., a new passenger car is under way, and 40 new freight box cars. The officers' car is being repainted. The locomotive work is mostly got out to templet, and all the wheels for cars are made in the road shops.

THE new shops of the Wilmington & Weldon road, at Wilmington N. C., are rapidly approaching completion. Theyare built of brick, are well designed, and when in operation with a full force will be adequate to the requirements of the road.

IT is reported that new car works are to be constructed at Curtis Creek, the terminus near Baltimore of the Baltimore & Ohio Railroad; $150,000 of the necessary $300,000 capital having been secured. The Baltimore & Ohio offers to start the works with an order for 2,000 cars.

THE Harlan & Hollingsworth Co. have just shipped to Rio Janeiro, Brazil, a cargo of railway materials, consisting of 10 passenger, 40 box and 40 gondola cars. The cars will be put together on arrival at Rio Janeiro by Philadelphia mechanics now at work there.

THIRTEEN of the 15 new passenger engines which are being built by the Baldwin Locomotive Works for the Philadelphia & Reading Railroad have been delivered. The other two will soon be turned out, when work will be begun on 10 new consolidahed "coal dirt" freight engines for the same road. Pea coal will be burnt in all the passenger engines.

THE Penn Inclined Railway in Pittsburg, Pa., just completed, is 840 feet in length, and the rise nearly 43 to 160. A 700 horse-power engine furnishes the power. The cables used in hauling the cars are of steel, 2¼ inches in diameter, and weigh 25 tons. Two cables are used on each car, and will sustain a load of 31 tons, though a strain of 173 tons was their test strength.

THE American Brake Company have moved all their St. Louis offices to their new works in that city, and are turning out from 75 to 100 sets of engine brakes a month. Their latest contract is for the equipment of a large number of fruit cars with brakes to run in express freight trains on Southern roads. The company have just given a trial order to the Missouri Malleable Iron Company for malleable parts for car and engine brakes.

THE car works and car wheel companies of Knoxville, Tenn., were recently awarded the contract for furnishing the East Tennessee, Virginia & Georgia Railroad with 500 standard box cars. The contract, including the castings, will aggregate $250,000, which is a handsome sum to keep at home and distribute among the Knoxville mechanics. Knoxville is only one of the many Southern cities now coming to the front as manufacturing centers.

THE Pennsylvania Railroad shops, at Altoona, are building five new class K engines, and on their completion will begin on ten of class P. They will be used for passenger service between Pittsburg and New York. The Pittsburg Locomotive Works have contracts for 45 locomotives, 13 of which are for the Pittsburg, McKeesport & Youghiogheny Railroad, and the remainder divided between the Cleveland, Pittsburg & Toledo, the Maryland Central, Pittsburg & Western and other roads.

THE impression entertained by many that higher speeds for freight trains must necessarily be attended with increased cost of repairs appears to be erroneous, according to the experience of the Cincinnati, New Orleans & Texas Pacific road in the running of fruit trains made up of ordinary box cars with ventilating openings, and at a speed of 25 miles an hour. At this rate of speed it is found that the fuel consumption is less than with ordinary trains, this gain resulting from closer points of cut-off at the higher speeds.

THE coal transportation over the Hartford & Connecticut Western road is rapidly increasing. The heavy coal barges of the Delaware & Hudson Canal Co. are towed across the Hudson River from Roundout to Rhinecliff, on the eastern side, where the Rhinebeck division of the road terminates, and are unloaded directly on the freight cars of the road bound for the East. The accumulation of coal at Roundout is sometimes very large, and a narrow-gauge road is talked of as an additional outlet for the enormous coal fields at Honesdale, Pa., from which the coal is now brought by canal.

THE Ensign Manufacturing Co., at Huntington, W. Va., is building 400 gondola coal cars for the New York, Pennsylvania & Ohio road, 300 box cars for the Louisville, New Orleans & Texas, and 150 box and 100 stock cars for the Chesapeake & Ohio. The company has also prospective orders for a large number of cars, and in order to accommodate its increasing business will shut down for a brief period to replace its present engine with a larger one. No passenger cars are built by the company at present, but shops will be built and fitted up for that purpose at no very distant day.

Mechanics contains a statement furnished by Mr. E. H. Parks, of Providence, R. I. showing what can be accomplished in the way of economy in the lubrication of shafting at the works of the Brown & Sharpe Mfg. Co., of that city. The bearings of 194 main-shaft hangers and 1,020 counter-shaft hangers, are oiled once a year at a cost of only $4.50 for the oil, the labor of replenishing the oil in the bearings being about 15 days' time. At the last oiling about six gallons of cosmoline were used, an oil that costs about 75 cents a gallon. There are 1,408 feet of main shafting, the most of which is 2 3-16 and 2 7-16 inch, and is constantly running.

THE railroad Christian Association at Indianapolis has undertaken a good work—that of furnishing the cabs of every freight train run out of that city with a tin box, in which shall be bandages, lint, pins, and other articles which would be of service when a trainman meets with an accident and his wounds need immediate attention. The boxes are to be arranged, and directions for use of the articles they contain, similar to those on the locomotives run on the Pennsylvania company's lines. As there are from 150 to 170 freight trains in and out of Indianapolis daily, the work undertaken is an important one and commendable to the association.

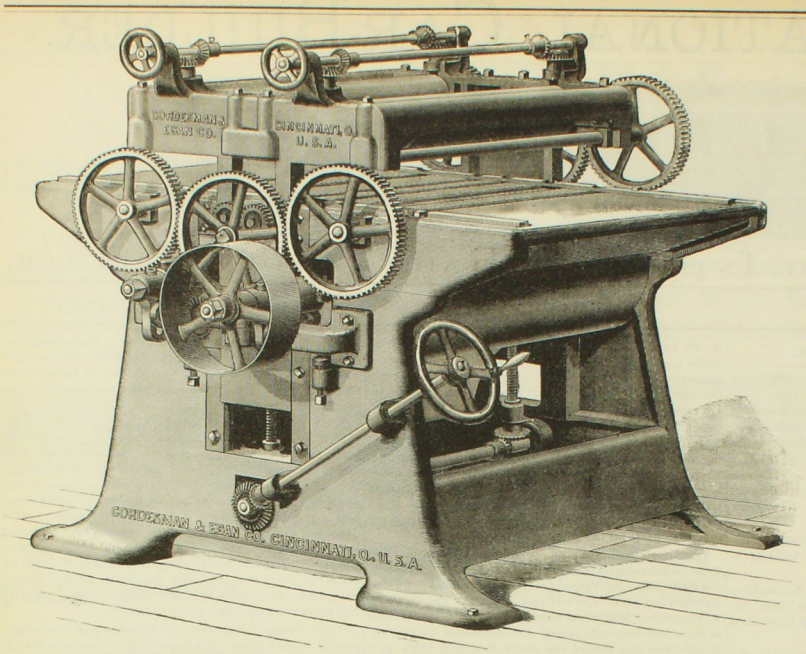
THE bridge now being built at Minneapolis, Minn., by the St. Paul, Minneapolis & Manitoba road, is one of the engineering wonders of the country. It is composed of 22 arches or spans, standing on 24 granite piers, the foundations of which rest many feet below the surface of the seething waters of the river. To dig these foundations took a great deal of money and engineering skill. Coffer dams had to be built and the water pumped out before the solid masonry could be laid, which would bid defiance to the swift current of the Mississippi. It will be finished by the 1st of November, and will be double-tracked before snow flies. So massive is it that trains will run over it at full speed without causing a vibration.

"THE average Chicagoan (says a Boston paper) is an epitome of all that is fast. He is (probably) born in a hurry, lives in a hurry, goes up in a hurry, and dies the first chance he gets, to make room for others who will beat his record or perish in the attempt. Fortunes are made before dinner, and the maker goes home at night a beggar. Somebody backs him the next morning with a "margin," and before night he has bought a house and lot in the park for $200,000, and paid the cash (he has also deeded it to his wife)—and so it goes on year after year."—[And the writer might have added that this same average Chicagoan would not probably consider the portrait very much overdrawn.]

THE returns of the English Board of Trade show that at the end of 1882 there were 18,457 miles of railway in the United Kingdom, of which 8,413 were single and 10,044 double track. In 1881 the total mileage was 18,175, an increase of 282 miles during 1882. It furthermore appears that the passengers carried last year were 654,838,295. This is exclusive of the metropolitan lines. The gross traffic receipts, including goods, reached the sum of £66,537,128 or £3,605 per mile open, or at the rate of 5s. 2d. per train mile, against the following figures in 1881, namely, £63,-908,237, £3,516, and 5s. 1¼d. respectively. The working expenditure was last year 52 per cent. of the total receipts from all sources, against the same amount in 1881.

AN Indianapolis paper says: A new and brilliant electric head-light for locomotives is being quietly perfected in this city by a modest inventor who does not care to have his name made known until a public exhibition has placed it beyond the possibility of a failure. The light will equal that of 4,000 candles. At present a twenty-candle light is the best that can be produced. It will light the track for a mile brilliantly, and the light will be full and continuous. The generator or dynamo will be run by steam at the will of the engineer. It will be located opposite the air-brake, and will not take up as much room. By the same, machine depots, bridges, crossings and tunnels will be lighted. Extending along the track for a half mile in both directions will be an electric wire connected with the lamps in tunnels and bridges; then, extending downward from the dynamo on the engine, the brush will be arranged to touch the wire as soon as it is reached. This will light up the object ahead, and as soon as the brush leaves the wire on the other side the light goes out A public exhibition will be given soon.

GEORGIA PINE is a timber which is being more extensively used every year in the construction of cars, especially at the South, where it is considered superior to oak in many respects. It is so filled with resinous matter as to be almost indestructible, and requires much less paint than the more porous woods. Although it is very solid and enduring, it is also heavy, and when used for car siding it makes a box car of the ordinary size weigh about 1,500 pounds more than if sided with white pine, unless the former is put on thinner, which it is claimed by Southern builders can be done without reducing the strength of the structure. For siding, it is necessary that Georgia pine should be free from knots, as these, under the heat of the sun, are apt to exude a good deal of crude turpentine and make a disagreeably sticky surface. Whatever drawbacks it may have, however, its consumption for car work in the Southern, Middle and Eastern States is sure to increase in proportion as other desirable woods get more scarce and higher in price.



30-INCH DOUBLE DRUM SAND-PAPERING MACHINE. (With Patent Brush Attachment.)

THE engraving represents a new Double-Drum Sand-papering or Polishing Machine, which is claimed to have advantages and conveniences possessed by no other machine now in the market for polishing all kinds of hard or soft wood, veneer work and short pieces. The frame is very solid and strong in all its parts. The feed consists of eight geared rolls, and is the most powerful that has yet been put on any machine. The four feed-rolls in the center are between the two drums so that very short stuff can be worked. All the upper feeding and pressure-rolls can be instantly adjusted by the hand-wheel placed in front, which is a great convenience. A piece cannot stall in the machine. The pressure-rolls over cylinders have independent adjustment by means of small hand-wheels, as shown. The Patent Brush Attachment is arranged so as to be of real service, as it is placed inside the polishing-rolls, and the work is thoroughly brushed and cleaned before going through the last pair of feed polishing rolls. Either or both polishing drums can be vibrated at once, and can also be run in opposite directions, so that one drum can raise the fiber and the smooth drum take it all off, the brush cleaning the piece before it passes through the feed polishing rolls. The ends of the bed can be instantly removed, thus giving free access to the drum so as to readily replace the sand-paper on the cylinder. The drum can also be removed without taking the machine apart, which will be found a great convenience. The double-drum machine is made of three sizes, to work 24, 30 or 36 inches wide, and will take from four inches thick to the thinnest veneer. The tight and loose pulleys on counter-shaft are 12×6½, and should make 700 revolutions per minute. For further information address the Cordesman & Egan Co., 235 to 255 West Front street, Cincinnati, Ohio.

THE Union Pacific, the Central Pacific, the Northern Pacific and the Atchison, Topeka & Santa Fe companies have contracted for the Westinghouse automatic freight brake for their entire freight equipment. The cost of this brake as furnished by the Westinghouse Air Brake Co. is $50 per freight car, the engine fixtures costing $300 per engine and $60 per tender. The Westinghouse Co., however, offers to give a discount of 20 per cent. on the car fixtures to companies contracting for their entire equipment before June 30, 1884, and a discount of 10 per cent. on contracts made from that date until the close of the year.

A RAILROAD conductor the other day paid out of his own pocket the fare of a woman who was hastening without ticket or money to her husband's death-bed in a Philadelphia hospital, at the same time conveying to her the impression that the fare was paid by a man who sat behind her, and had expressed his sympathy. That person promptly put the credit where it belonged, and subsequently took occasion to ask the conductor why he had waived his own claim to the woman's gratitude. "My dear sir," was the reply, "when you have been a conductor for ten years and been 'beaten' and snubbed by 999 different specimens of traveling humanity, you will learn to do your duty and be satisfied with that alone. That woman's distress was real, but possibly nine out of every ten I meet with similar stories will be professional dead-beats and frauds of the first water. If a conductor does a humane act now and then and the public hear of it, a few will compliment and praise him for it, but for the next six months every tramp and shyster along the road will strike his train and endeavor to cheat him out of the fare by working upon his feelings."—*Ex.*

THE report of the Columbus, O., railway branch of the Young Men's Christian Association for the month of July is as follows:

Attendance, readers	3,555	
Lady visitors	46	
Total attendance at rooms		3,601
Attendance Sunday services	655	
Attendance cottage meetings	12	
Total attendance at religious services		667
Grand total visiting rooms and attending religious services and entertainment		4,268
Letters written in room		203
Men calling for stamps and postals		367
Registered visitors		128
Men calling for papers		117
Papers distributed		304
Papers donated for distribution		91
Papers filed		475
Books drawn from library		104
Visits to sick		1

LAST fall a narrow-gauge road twenty-two miles long was planned and a company organized in Wisconsin, and an Eastern man who scented a chance for a profitable investment called upon the President to make some inquiries.

"How is the new line getting on?" he asked, after some general conversation.

"Splendidly. We have the right of way for the first five miles, and have taken steps to gobble it for the other seventeen."

"How much stock have you issued?"

"Two hundred thousand dollars."

"And how much has been sold?"

"Well, you see, it has all been preliminary thus far. We have sold enough stock to buy blue uniforms for all the general officers, furnish up several rooms with mahogany desks and moquette carpets, and as soon as we can work off sufficient to purchase horses and carriages for the president, secretary, and treasurer, and furnish the superintendent with a yacht, we shall begin the real serious work of building up a grand trunk line."—*Wall Street News.*

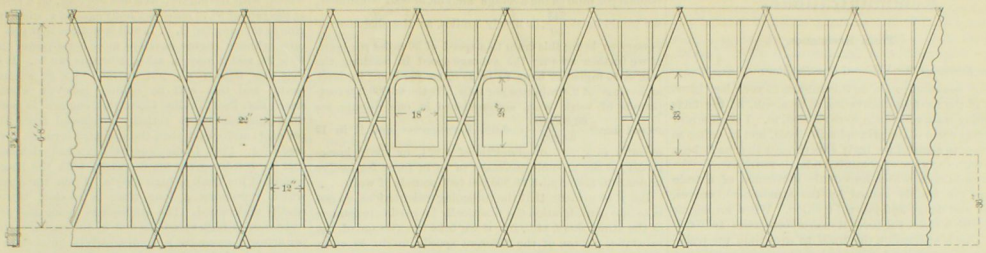
A PHILADELPHIA paper remarks that "there is unusual activity promised for the coming season in railway construction and equipment in that State, where more than a dozen roads will be under contract. The different coal-carrying companies have ordered in the aggregate 10,000 new coal cars and additional locomotive power in proportion. The Pennsylvania Railroad is adding six engines per week to its present supply, and has placed a large order with the Baldwin Locomotive Works. The Reading Railroad has given an order to the Baldwin Locomotive Works for thirty engines to be built within the next six months, and has its own shops engaged upon new locomotives The Baldwin Works now employ 2,800 hands and will turn out 240 engines during the next six months. This activity is accompanied with renewed inquiries about rails. The Bethlehem Iron Company last week received an order for 1,000 tons, and the Cambria Iron Company expects several large orders. The Edgar Thomson Works the Pittsburg Bessemer Steel Company and the Pennsylvania Steel Company are in receipt of inquiries, aggregating about 50,000 tons, which, when turned into orders, will keep them busy and add stability to the iron market."

A WRITER in the New York *Sun* says: "As a scholar Jay Gould applied himself with diligence to his books, but in all branches, save mathematics, he was regarded as a regular dunce. In mathematics, however, he excelled all others of his age and many of his elders. He seemed, in fact, to have a special faculty for this one study, and he improved it to the utmost. When he was twenty or thereabouts, he had already become a skillful surveyor, and he conceived the project of making a map of Delaware County, and of compiling a history of its earliest settlers. Not wishing to allow any one, not even his father, to profit by his venture, he first perfected an agreement with Gould, Senior, by which, for a certain sum, he (Jay) should be allowed his time until his majority. His plans resulted in a careful survey of the county, and in a map of it, which, by the way, is a marvel of accuracy. Many of these maps may still be seen hanging upon the walls of the homes of the inhabitants of that county and the surrounding counties. His history has some merit, too. Many copies of it are still extant. In this venture he cleared $5,000—quite a fortune in those days—and gained the reputation of being a smart and sharp young man."

MR. D. B. KAGENAAR, of the University of Utrecht, recently devised a novel arrangement for registering the speed of trains while passing over bridges. It consists of two parts. At each end of the bridge is fixed a pedal, placed against the rail so as to be depressed by each wheel of the train passing over the spot. Each depression of the pedal makes contact in an electro-magnetic circuit, which, in the second part, acts on needles placed against a cylinder situated at any convenient distance. This cylinder is made to revolve by clockwork at a uniform speed, and is covered with a sheet of paper. While no wheels pass the pedals on the bridge, the needles mark straight parallel lines on the revolving paper sheet; but if contact is made as above mentioned, the respective needles are momentarily deflected, and mark the instant at which each wheel passes the pedal in connection on the bridge. The distance apart of the pedals at each end of the bridge being known, as also the rate at which the registering cylinder revolves, the speed of the passing train can be deduced by simple measurement of the distance apart of the traces made by the marking needles. As a further check, the number of axles of which the train is composed is marked at the same time and in the same way by the needles deflecting at each contact in the circuit.

THE Marshall Foundry & Machine Company, Marshall, Tex., are preparing to erect a new wheel foundry and other buildings. The wheel foundry will be 75 feet wide and 115 feet long. The walls will be 20 feet high, with a lantern roof 40 feet above grade. The new foundry will enable the company to increase its present capacity of 10,000 per annum to over 40,000. The company is far behind its orders, but hopes to have its new buildings in working condition very soon, when it will be in shape for any reasonable amount of new work. The company has just finished a liberal order for stock and coal cars for the International & Great Northern, and is now working on an order for coal cars, or gondolas, for the Texas & Pacific Company.

THE South Carolina Railroad Co. is building at the Charleston shops 12 freight cabooses, 100 box cars, one combination passenger and baggage car, and one passenger coach. The cabooses are 16 ft. long by 8 ft. 7 in. wide, with turret tops. Between each pair of wheels are equalizing levers which make the bodies ride easier. The box cars are 30 ft. in length and 40,000 lbs. capacity. The combination car is 46 ft. long by 8 ft. 7 in. wide, finished inside with stained poplar, and is designed for second-class travel. The passenger coach is 53 ft. long and finished in mahogany with beech ceiling. The outside color is Tuscan red, which is the road's standard color for passenger equipment. Mr. George H. Gramling is the Master Car-Builder. The locomotive department is in charge of Mr. P. J. Cochrane, the Master of Machinery of the road. He is building a new 10-wheel engine with 16×24 cylinders, and three engines are in for repairs. The boilers of the engines of this road are jacketed with kaolin mixed with jute. There are large deposits kaolin in the vicinity. As a non-conductor of heat it is superior to wood, and it does not crumble or burn out. Georgia pine is used for tender frames, and also for tender and passenger car trucks. All the castings for the road are made at these shops. A large steam hammer is used in the blacksmith shop to cut off and piece out old freight axles. Mr. Cochrane is of the opinion that journal bearings if faced with babbitt or any softer metal, will cut the journal by holding the sand and grit which work in, but the lead-lined bearings so extensively used do not seem to confirm this theory.



Shaffer's Improved Trussing for Passenger Cars.

The drawing represents what is claimed by the inventor (Mr. Edw. D. Shaffer, of Moncton, N. B., the Master Car-Builder of the Intercolonial Railway) to be an improved method of trussing the sides of passenger cars, so as not only to dispense with the usual under-trussing, together with the sill-and-plate rods, but to increase at the same time the vertical stiffness of the car side to such an extent that the car body can be made long enough to carry a hundred passengers without materially increasing its weight. The position and arrangement of the braces are shown in the cut. They are of $1\frac{1}{4} \times \frac{1}{4}$ inch wrought iron, bolted, as shown, to the sill and plate with $\frac{1}{4}$-inch bolts, and the ends turned over the plate and under the sill $1\frac{1}{4}$ inch. The crossed ends of the straps or braces are let in flush with outside frame.

This plan is such a new departure in construction that its practical utility can only be determined by actual test. The principle seems to be a good one, but a great deal depends on the way it is applied. Most car-builders could probably suggest different ways of fastening the braces to the plate and sill, or top and bottom chords, and notwithstanding the depth of the truss, the question might be raised whether the improved method is equal to the combination of the longitudinal rods, the truss-plank and the vertical tie-rods, in keeping the car body from sagging, especially if it were made longer and carried a heavier load.

THE Schenectady Locomotive Works are now quite busy, having orders on hand that will keep them going for some time. The work in progress comprises four consolidation engines, with 20×24-inch cylinders and 50-inch drivers for the Kentucky Central Railroad, and eight passenger engines, weighing 45 tons each, with 18×24-inch cylinders, for the Canada Southern Division of the Michigan Central Railway. The company have lately taken orders for seven mogul freight engines with 19×24-inch cylinders, for the Lake Shore & Michigan Southern road, and 45 freight engines, having 17×24-inch cylinders, for the Chicago & Northwestern road.

THE New York, West Shore & Buffalo Co. is driving the power in its new shops in a novel and effective manner. Instead of belting from the engine to the line shaft in the usual manner, each shaft is driven by an independent engine, coupled directly to it. To effect this, the arched doorway in the central brick partition is strengthened by piers, and a second arched opening left over it similar to a transom. The floor of this opening forms the foundation for a Westinghouse engine, which is set with its centres exactly in line with the shafting to which it is coupled on each side. No regular engineer is employed, but the engine is considered a part of the shafting and is in charge of the wiper. The Westinghouse Machine Co. has so far fitted up the shops at New Durham, N. J., with a 12×12, at Kingston and Syracuse, N. Y., each with a 9×9, and at Schenectady with a 7×7 in. cylinder engine.

MR. R. S. ELLIOTT, of St. Louis, has a book in press, entitled "Notes Taken in Sixty Years," and from which the *Railway Register* takes the following: "It is a queer and generally unknown fact that the first railroad journal ever issued was published at Rogersville, Tenn., 1830-31. Clinton Armstrong was then publishing a religious monthly magazine of Calvanistic character, and in addition issued weekly for one year the *Railroad Advocate*, telling its readers about railways, so far as then known, and urging their construction. John A. McKinney, of Rogersville, was a believer in rapid transit by rail, and in an address published in Mr. Armstrong's *Advocate*, told the folks in butternut jeans that if they had a railroad a man might breakfast in Knoxville and dine in Abingdon! In 1845 Clinton Armstrong removed to St. Louis County, Mo., to the well-known homestead of the family near Kirkwood, where his sons yet reside."

THE Inter-State Industrial Exposition, at Chicago, will be opened September 5 and close October 20. The average paid admission last year was 9,475 daily, and this year it will undoubtedly be larger. Every foot of space is already occupied. The display of machinery will surpass that of last year, and will include railway and mining machinery, the apparatus of eight electric light companies, etc. Agricultural products will be exhibited by the Northern Pacific, Chicago & Northwestern and the Atchison, Topeka & Santa Fe roads. The Interior Department of the government has consented to have the last named road bring a company of Indians from New Mexico, who will exhibit their looms, manufactured blankets, metal ornaments and archæological specimens in four rooms in the south gallery. The art display will be specially attractive, and will include contributions of European artists obtained from abroad by the Secretary of the Art Commission. Besides these, there will be many new features of peculiar interest.

AT the last meeting of the Master Car-Builders' Association, we believe, a committee of the representatives of leading railroads was appointed for the purpose of designing a standard car for freight purposes. While we have the greatest respect for the Car-Builders' Association and for the sound judgment which has marked their proceedings ever since the organization of the society, we can not help feeling that this committee has been appointed under the mistaken idea that a standard freight car is now possible. We do not think that at the present time it is advisable to attempt deciding upon standard sizes or proportions of a car. Sixty thousand pounds is the load which it is proposed to carry. We think it probable that before a standard car can be fairly decided upon, railroad managers will be calling for a car capable of carrying a load of 80,000 pounds. Such a load will require an entire reconstruction of railway rolling stock; probably it will be even necessary to commence at the wheels and work upward. Unless iron be used as a material, we do not see how the full capacity desired can be obtained economically, and this is a proposition not likely to be entertained by the car-builders at the present time.—*Mechanics.*

A Compound Steam Motor.

The system of compounding locomotives does not appear to receive many adherents in America, although the idea seems to be gaining friends abroad. Britain, France and Germany have railways that are building numerous compound locomotives, and now an American shop has just turned out a small specimen of that type for the Australian government. The railroads and tramways around Sydney are operated by the government of the colony, and they recently ordered a steam motor to be made at the Baldwin Works, Philadelphia, on the compound principle, for use on their tramways and suburban railroads. Drawings for the work were furnished, and the superintendent of machinery for the Australian government came to Philadelphia and attended to the construction of the machine. The boiler of this motor is of the upright pattern, and two pairs of vertical inverted cylinders stand above the driving shaft not unlike the way that some small marine engines are arranged. The high pressure cylinder stands on top of the low pressure cylinder, and both pistons are fastened to one piston rod. Considering the character of the engine, the working parts are few and simple. To watch the engine working an observer would see nothing beyond the ordinary run of street car motors, unless he happened to observe the numerous cylinders. Steam is distributed by the Joy valve motion, which has been preferred because it can be operated without eccentrics, which are objectionable on axles that stand so near to the ground. The steam is exhausted from the high pressure cylinders into a casing, from whence it is taken by the low pressure cylinders as the valve directs. By a very simple mechanism, easily worked by the engineer, the live steam from the boiler can be supplied direct to all four cylinders. This direct working or compounding can be changed as readily as the ordinary engineer hooks back the links for increased expansion. The designer of the motion regards this attribute as one of the finest features of the engine, for the engineer has constantly at hand a large reserve power to aid him to start on a grade or to ascend an unusually steep incline. The boiler, of course, would not supply steam directly to the four cylinders for a long pull, but it will meet the demands for starting, and short, steep climbs. Around Sydney the streets are said to be very hilly, and this motor is expected to be specially successful in working over such ground.

This motor is inclosed in the end of the car, which is constructed to accommodate the passengers it will transport. The car is 38 feet long, and is handsomely finished in a style closely resembling our finest street cars. Seats are arranged on the roof, and altogether it is intended to seat 60 passengers. The car was built by J. G. Brill & Co., of Philadelphia. Baldwin has about forty motors running in South Australia, and they are well liked by those who use them. They are considered much better adapted to the uses of a new country than the average car of British make. British machine and car-builders were naturally solicitous to keep Americans out of their colonial market, and they have indulged in unscrupulous abuse of American productions in hopes of retaining a monopoly, but their efforts were vain. American railroad appliances are their own best advocates when they reach any foreign country. While European makers continue to build the same kind of a machine or car for a new country which is found adapted to the work in London, or Paris, or Berlin, American builders will have no difficulty in holding their own against all the abuse that can be manufactured. Our makers regulate their productions to suit the work they are intended to perform; European manufacturers are continually trying to compel colonists to adapt their wants to suit the goods they can most easily supply. Trade proselytizing is not generally successful when it causes extra trouble and expense.

Texas & St. Louis Railway.

This road is 3-foot gauge, and extends from Bird's Point, Mo., to Gatesville, Texas, a distance of 732 miles. For a distance of 50 miles south of Bird's Point it is without a curve. The most remarkable feature of the road, says the St. Louis Globe Democrat, is its bridges. Seven miles North of Pine Bluff the Arkansas River is crossed where it is 1,542 feet wide. Here the bottom is very treacherous, necessitating a great depth of foundations, which go down sixty to seventy feet below low water. The variation between high and low water is thirty-two feet, and the bottom chord of the bridge is ten feet above high water. Hence the iron cylinders forming the piers had to be made from 102 to 112 feet deep. The bridge has five combination spans of 203 feet, two shore spans of 102 feet, and a draw span of 358 feet, with seventy-four feet of trestle at the north and 150 feet of trestle at the south approach, making a total of 1,801 feet. The two abutments and the seven piers outside of the pivot pier are made of two cylinders of seven feet diameter, placed sixteen feet apart center to center. The pivot pier has a central cylinder of seven feet diameter, with six outer cylinders, each of four feet diameter, arranged at the angles of a regular hexagon. These cary a turn-table twenty-six feet in diameter. All the cylinders are filled with concrete, made from Louisville cement and granite from Fouche mountain.

Wilson's Truck Lock.

The St. Louis *Railway Register* says that a test of this device was recently made at the shops of the Missouri Pacific road in that city, in the presence of General Manager Talmage and a number of other railroad men. It is the first attempt, says the *Register*, to lock a car truck to prevent cars from being ditched. The only protection heretofore applied to keep the truck in line has been the ordinary check chain, which is far from being satisfactory. It is generally regarded as being too weak to stand a severe strain, and it is practically found to be useful only because it is the best hitherto known. In this new device there is the element of strength to recommend it. Railroad men universally declare that if the truck can be kept in line of the rail in case of derailment, the chances of a serious wreck are largely diminished. With Wilson's device this can be done, as it is strong enough to prevent the truck from turning or "slewing," and thus holds it parallel with the track. The device is simple and nearly as cheap as check chains, and requires no particular mechanical skill to apply it. As the traveling public is deeply interested in any appliance which will furnish greater security to life and limb than that at present enjoyed, we place the matter before them, as it promises a new and healthy departure in the right direction. Judging from the trial made, it would appear that the device has much merit in it, and is one which must sooner or later be adopted by railway companies which appreciate the value of security in railway travel, and are anxious to preserve their own property from destruction through railway disasters.

Communications.

Train Resistance.

To the Editor of the National Car-Builder:

In my communication on this subject in your last issue, a few of the modern discoveries, so to speak, of the facts governing train resistance were referred to. I propose now to discuss some of the principles involved, and in doing so will refer to some of the early experiments that have been made with the view of obtaining reliable results.

The resistances which impede the movement of a train of cars are mainly caused by the atmosphere, curves, grades, and flange and journal friction. When an engine starts with a train, the force it exerts comprises two factors. One is exerted on the train to overcome the resistances, and is destroyed or neutralized by these resistances. The other, or excess, remains and keeps the train in motion. Thus, each stroke of the piston or revolution of the wheels supplies additional force, which is partly destroyed and partly appears in useful effect by adding a renewed install ment, which, with the previous accumulation, adds to and increases the excess, and the speed is increased until the increase of resistance from the above named causes equals the entire force of the engine, the result being a uniform speed. If, however, the train at the start is so heavy and the resistances so great that the whole power of the engine is expended in overcoming the resistances alone, no part of such power can be stored in the train to increase its speed, and any greater speed is therefore impossible. The case is somewhat analogous to that of a laborer who earns $1.25 a day, while $1 of it is absorbed in the cost of living, the excess, as it accumulates day by day, being deposited in a savings bank as "useful effect."

Work consists in the overcoming of a resistance in any direction. Thus, if a resistance of 10 pounds is overcome in a distance of 5 feet, the result is $5 \times 10 = 50$ foot-pounds. The element of time enters, however, when it is desirable to ascertain the comparative amount of work performed. To ascertain, for instance, the amount performed in hauling a train weighing 400 tons exclusive of engine a distance of ten miles, or 52,800 feet, we have first to determine the strain on the draw-bar of the tender, which is the resistance. This we will assume to be 2,400 pounds. The foot-pounds of work will be represented by the product of the resistance (2,400 lbs.) and the distance (52,800 ft.) through which this resistance was overcome, this product being 126,720,000 foot-pounds.

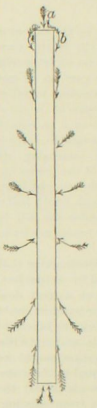
The accepted valuation of a horse-power is the lifting of 33,000 lbs. one foot in one minute. If we desire to ascertain the horse-power required to perform the work of moving the above train under the conditions named, we must evidently ascertain the time occupied in hauling the train ten miles. Assume that time to be 100 minutes. If now, the 126,720,000 foot-pounds of work were accomplished in one minute, the horse-power required would be $\frac{126,720,000}{33,000} = 3,840$ H. P. If it were performed in two minutes, one-half, or 1,920 H. P. would be required, while if 100 minutes were used, it would require but one-hundredth part, or 38.4 H. P. While 126,720,000 foot-pounds represent the work of moving the train ten miles, and 3,840, the horse-power necessary to cover that amount of *foot-pounds* in one minute, it does not follow that that amount of horse-power, or any other amount, would move the train ten miles in one minute, from the fact that the rapid increase of the atmospheric resistance at and above 60 miles per hour, is so great as to practically limit the speed attainable to about that figure.

To ascertain the amount of coal necessary to haul the train over the ten miles is an easy problem, for it has been found by experiment that for every pound of coal burned in a locomotive fire-box, the engine is capable of exerting from 240,000 to 300,000 foot-pounds. If we take 275,000 foot-pounds as representing the average engine, we have $\frac{126,720,000}{275,000} = 460$ pounds as the amount of coal for the total distance, or 46 pounds per mile. The amount of work or coal necessary to bring a train to a given speed is seldom appreciated. The foot-pounds of work necessary to bring a train from a stand up to a given speed is equal to lifting the weight of the train vertically to a height from which, if the train fell, it would attain a speed equal to the given speed. Suppose a train of cars and engine to weigh 400 tons, and it is desired to ascertain the foot-pounds of work given out or destroyed in bringing the train to a speed of 50 miles per hour, or 73.33 feet per second. We have here the velocity given to find the height due to that velocity. The formula for this is when h represents the height and v the velocity $h = \frac{v^2}{64.4}$. Applying this, and we have:

$h = \frac{73.33^2}{64.4} = 83.5$ feet, as the height necessary for a body to fall and attain a speed at the rate of 50 miles per hour. The weight of the train being 400 tons, or 800,000 pounds, the foot-pounds represented as necessary to lift that weight to 83.5 feet equals $83.5 \times 800,000 = 66,800,000$ foot-pounds. If we take each pound of coal as equivalent to 275,000 foot-pounds of work, we have $\frac{66,800,000}{275,000} = 243$ pounds of coal nearly, as the amount necessary, and if we assume 50 pounds per mile as the average amount of coal consumed, we would have $\frac{243}{50}$, or nearly 5 miles, as the distance necessary to bring this train to a speed of 50 miles per hour. If we further assume the average speed in reaching the rate of 50 miles per hour to be 25 miles per hour, we have an average of 2.4 minutes per mile. If the 66,800,000 foot-pounds of work were accomplished in one minute, we would have $\frac{66,800,000}{33,000} = 2,024$ horse-power, and if in 12 minutes (5×2.4), one-twelfth of 2,024, or 168¾ horse-power, as the amount necessary to be in force for twelve minutes to accomplish 66,800,000 foot-pounds of work.

But it is evident that the foregoing calculations do not take into consideration the practically increasing resistance of the atmosphere, etc., for if we take the average of the resistance per ton of the different speeds up to 50 miles per hour, we have that average as 10.5 pounds per ton, or a total resistance of 4,200 for the entire train. Taking the average speed of the train from a stand-still to 50 miles per hour, at 25 miles per hour, or 2,200 feet per minute, and we have $\frac{4,200 \times 2,200}{33,000} = 280$ as the average horse-power required. If, however, we assume that it requires a *constant* force of 4 pounds to overcome the axle and rolling friction alone, as has been shown to be true experimentally, or $4 \times 400 = 1,600$ pounds as the total for the entire train, and deduct this from our average propelling force of 4,200 lbs., as the formula does not take note of such, we have 2,600 lbs. as the average propelling force when neglecting the axle and rolling friction. Substituting this in the formula, we have $\frac{2,600 \times 2,200}{33,000} = 176$ H. P., which practically agrees with that found from the calculations of the foot-pounds of work, namely 163⅓ horse-power. It would require practically at least five miles to bring our train to a speed of 50 miles per hour if the engine were handled in anything like an economical manner. Applying the formula for accelerated motion, when the *weight*, *final velocity* and the *force* are given to find the *space*, which is when S represents the space, w the weight, f the force and v the velocity $S = \frac{w\,v^2}{64.4\,f}$ then $\frac{800,000 \times 73.33^2}{64.4 \times 4,200} = 15,963$ feet as as the distance necessary to bring the train to a speed of 50 miles an hour. This is a little over 3 miles, and the discrepancy is due to the practical conditions of resistance of axle and rolling friction which it fails to consider or provide for. Making the same allowances in this formula as in the preceding, and for the same reasons, and we have $\frac{800,000 \times 73.33}{64.4 \times 2,600} = 25,692$ feet, or 4 miles, and 4,572 feet as the distance necessary to get up the speed of 50 miles and hour, which agrees with our roughly deduced distance from the coal consumption. The formula for the time necessary to perform this work alone—t represents the time, w the weight, v the final velocity, and f the force—is $t = \frac{wv}{32.2\,f}$ then $\frac{800,000}{32.2} \times \frac{73.33}{4,200}$ 433 seconds, or 7¼ minutes nearly. Making the same changes in this formula as in the preceding one, and for the same reasons, and we get $\frac{800,000 \times 73.33}{32.2 \times 2,600} = 701$ seconds nearly, or 11 minutes and 41 seconds, which agrees with the time as estimated, practically.

So much for the theoretical part of the problem. Let us now see what size of engine we need to pull a train weighing 400 tons 50 miles per hour. In the previous investigation, the resistances, etc., were taken from "standard authorities." Prof. Dudley found with his dynagraph car that with a train of three passenger cars at 40 miles per hour, the resistance per ton was from 30 to 36 pounds, and with nine cars at 50 miles per hour the resistance was but from 10½ to 11 pounds per ton. As our train is somewhat heavier than the one giving the above resistances, the resistance per ton would not be probably over 10 pounds per ton, or $400 \times 10 = 4,000$ pounds for the entire train; 50 miles per hour equal 4,400 feet per minute, when $\frac{4,000 \times 4,400}{33,000} = 533\frac{1}{3}$ H. P., necessary to move the train at that speed. It has been stated on good authority that it requires at least 20 pounds per ton of engine and tender to overcome its own resistance. If our engine and tender weigh 70 tons we have $70 \times 20 = 1,400$ pounds resistance for the engine, and $\frac{1,400 \times 4,400}{33,000} = 186\frac{2}{3}$ H. P. as necessary to propel the engine alone, or 740 H. P. for the engine and train. Let us take an 18 × 24 cylinder and 5½-foot wheel with a mean effective pressure of 50 pounds per square inch on the pistons. It results in 786.6 H. P., although doubtless a 19 × 24 cylinder would be better. This is a little less than the horse-power of Dudley's train and is due to several causes. The speed of his train was nearly a mile an hour more, and a wind of about 5 miles an hour was against him. The conditions existing in practice can not all be taken into account in a mere theoretical deduction. A straight and level track is of course assumed. It is on record that Prof. Dudley with an engine, having 17 × 24 cylinders, and 6 feet drivers, tested a train of cars, which, with the engine, weighed 313 tons, on a level track at the rate of 50.70 miles per hour against a wind, the engine developing 788 H. P. It will be noticed that this 17 × 24 inch cylinder engine develops more horse-power than our 18 × 24, and it may be asked how this can be. It is clear that the figures do not do the 18 × 24 engine full credit, and this will be readily believed when it is stated that Prof. Dudley found that engines in service at their minimum effort actually developed from 25 to 100 per cent. more work than the standard formula gave them credit for. Prof. Dudley's experiments have demonstrated that the resistance per ton decreases with the length and weight of the train at high speeds. From the engraving, which represents a long train in motion, this will be readily understood. The atmosphere being the principal resistance at high speeds, is met by the engine's front, as per arrow *a* assuming a comparatively quiet state of the air, and is deflected as per arrows *b*, and continues to



catch in the window depressions and between the cars, until on a long train, it is believed at and near the back end, a belt of air is drawn along the sides with the train by suction, hence the addition of cars to the back end of a long train if the speed is high, will not increase the resistance in anything like the degree that the adding of a car to a train of two or three cars would; because the air at the back end of the train is already put in motion by the cars at and near the front end, and follows with the train to some extent, and thus the resistance of the last cars is largely made up of journal and flange friction, while the resistance of the leading cars is composed of these factors and, in addition, that of the atmosphere.

It is a well known fact that American cars haul easier per ton than foreign or European cars, from the fact that the American truck is free to adjust itself to the curves, while the European cars have their wheels set in rigid jaws, which are incapable of swiveling to accommodate the curves, etc. It is of course true that European cars are shorter and track curves longer, still, with the disadvantages of our roads in these respects, the swiveling truck much more than puts them on an equality for easy draft. A leading English paper, and an authority on railroad matters, recently estimated the resistance per ton at a speed of 50 miles per hour for American cars in a train of 460 tons, to be 25 pounds per ton—probably judging from English cars, while it has been already shown by Prof. Dudley's experiments, that the resistance is as low as 10 pounds per ton. This fact is, it appears, recognized in England, for in Colburn's Locomotive Engineering we find:

"But the great practical improvement of the day, at least so far as English rolling stock is concerned, is to be the substitution of radial axles and axle boxes. * * * * The practice of the United States, in the universal adoption of bogies under the engine tenders, carriages and wagons is well worthy of analysis. * * * * It must also be affirmed that by means of the bogie the tractive resistance of engines and trains is notably less than that of parallel axled stock."

In the same work we find the following formula for use "in ordinary practice" for the resistance per ton of engine, tender and train, R being the resistance and v the velocity:

$R = 12 + \frac{v^2}{114}$, which gives for a speed of 50 miles per hour 34 pounds per ton. Applying this to our assumed train of 400 tons at 50 miles per hour, and we have $34 \times 400 = 13,600$ pounds total resistance, and as 50 miles per hour is 4,400 feet per minute, we have $\frac{13,600 \times 4,400}{33,000} = 1,813\frac{1}{3}$ H. P. as necessary to pull an English train at that speed under ordinary conditions. It will be remembered that it required 740 H. P. to pull our train at 50 miles per hour, or considerably less than half of that required by the English train of the same weight.

If we are to believe the published data of the Bavarian experiments made by Baron Von Webber, at Munich, the expenses of hauling trains must be very heavy. Following is a portion of the data:

Velocity in miles. per hour.	Resistance in pounds. per ton.
0	5.0
10	6.7
20	10.0
30	52.2
40	117.0
50	223.7
60	383.6
70	605.2

According to these figures, an ordinary engine with no load would be just able to make 45 miles per hour.

F. S.

THE Chesapeake & Ohio road has for several years been using on its cars a single cast-iron dead-block bolted to the end-sill directly over the draw-bar, and having a circular vertical depression on the face so the pin can be pulled with safety even when the blocks on opposite cars are in contact. This style of block is being replaced with a single wood block, as being cheaper and equally effective. It would be interesting to know the dimensions of the wood blocks, and whether the link and pin can be handled with safety in case the blocks come in contact by the force of the collision.

The Extended Smoke Arch.

To the Editor of the National Car-Builder:

During the late Exposition of Railroad Appliances at Chicago I made a trip to that place to see the sights, which were of special interest to me so far as locomotives are concerned, inasmuch as I am a locomotive engineer.

I have heard a great deal about the effectiveness of the extended smoke arch. Although my engine is as yet without that improvement, I understood that it did away with all cinder throwing, so disagreeable to passengers and so destructive to car roofs and car paint. I left Cincinnati and went to Indianapolis, riding on the smoking car behind an engine with an extended smoke arch. The train was heavy, and the engine was necessarily worked hard, but of all showers of sparks I have been subjected to in my railroad experience, that was certainly the worst and heaviest. The car door was open, and the floor was covered from ⅜ to ½ an inch deep with sparks, all good sized ones about ¼ inch in diameter, so to speak. A constant rattling of sparks on the windows reminded me of the "zip" and "ping" of the musket balls at Seven Oaks, while my hair, shirt-bosom and clothes would serve as a coarse sand belt if rigged on wheels. After leaving Indianapolis, I rode in the smoking car, but behind an engine with the ordinary diamond stack and smoke arch, and although the car door was open and the train heavier, not near as many sparks came into the car as before. In fact, the difference was very noticeable in favor of the common stack and smoke arch. Now, this is a true statement, as I found it, so please publish it for what it is worth, as I intend to talk my master mechanic out of the notion of extended smoke arches, at least as far as their non-spark throwing qualities are concerned.

LOCOMOTIVE ENGINEER.

The Joy Valve Gear.

To the Editor of the National Car-Builder:

In the August number of your paper appears a communication signed "Franklyn," containing the following injurious statement in regard to the Joy valve gear, and which, inasmuch as you have published it, I, as the representative of such gear in this country, can not allow to pass unnoticed:

"The sliding, wedging motion of the Joy block in the radius-piece must produce rapid wear—in fact, the writer was informed by an English railroad official that the objection found to the Joy gear by English locomotive builders was that the rapid wear of these parts was such as to make it doubtful whether it was suitable for locomotive work."

Now, I say that "Franklyn's" supposition is erroneous and misleading, and I aver that the unquestionable fact of the very general adoption of the Joy gear by English railways, after two years exhaustive test, and the making it their standard gear in lieu of the link-motion, is far better evidence of its freedom from objectionable features, excessive wear, etc., than are "Franklyn's" surmises or any itinerant English railway official's gossip, as any impartial person will readily admit.

I say, furthermore, that a sliding, wedging motion, block and radius piece, though altogether unobjectionable as found in Joy's gear after long practice, are no more necessary to the successful working of this gear than horns are to "Franklyn."

The design of Joy's valve gear approved by American master mechanics has no such block, wedging motion or slide. So what necessity is there for such comments? We are acquainted with the fact that there is more than one English railway official going around these United States making such statements as the one quoted above, and we also know something of their motives for so doing.

WAYLAND TURNER.

Wear of Wheel Flanges and Rails.

To the Editor of the National Car-Builder:

The subject which heads this communication is very properly receiving the attention of engineers and mechanics, and as it is a matter of dollars and cents as well as a source of danger and trouble, a few words in regard to it may not be out of place in your columns.

The wear of flanges is inevitable and can not be entirely prevented. But if it can be reduced to a minimum and equalized, and the causes of variable wear ascertained, much good will result therefrom. The diversity of wear has been ascribed to several causes, some of which appear to be reasonable while others can hardly be accepted as sound. Among these alleged causes is trucks out of square. This condition of the trucks may cause two diagonal wheels to wear more than their mates or than the other flanges of the same truck, when running in one direction, say in going east; but on the return trip, would not the other wheels be subjected to the same wear, and so in a measure equalize it? The wear is also said to be due to an unequal distribution of the load on the car body. This may be the case for one trip, but on the return, the other end or corner of the car may carry the excessive weight, perhaps, and thus equalize the wear. A soft wheel is expected to wear out rapidly, and doubtless the weight on side-bearings and carelessness in pressing on wheels cause unequal wear. But there are causes of diversity in the wear of wheel flanges as well as of rails, other than these. Rails do not wear uniformly in all places, or on all roads with the same traffic, and the chief cause of this is identical with that of unequal flange wear. Many stations are located at or near curves, and in stopping or slowing trains, the action of the brakes and the momentum of heavy fast running trains, thrust some of the flanges against the outer rails more forcibly than others. When the brakes are set on the locomotive, each car of the train has a tendency to force the flanges of the rear truck of the preceding car against the outer rail, thus grinding off the flanges and rail-heads and sometimes causing derailments. The particular wheels that receive this rough usage on one trip will be subjected to the same usage on the next, and a continuous repetition of this causes some flanges to wear sharp while others are worn comparatively little if any. Furthermore, if a station is at or near the foot of a grade, in addition to the curve, the unequal wear will be more apparent. Imagine a local train making daily stops under these circumstances, and at several stations similarly situated, and we have the chief cause of diversity in rail and flange wear. The easy curves on English roads will have this effect on flanges. In hilly and mountainous regions these conditions are frequent, and in many cases there is a preponderance in one direction, as for instance, east-bound trains may be obliged to slow on down grades and curves and stop at stations situated as above described, more frequently than west-boun trains.

It will be seen that in this way some wheels receive very different treatment from others, and if they are in a certain part of the train for any length of time the flanges will be excessively worn. There are local trains made up of certain cars that are kept in a certain position in the train for months, or years even, until they are sent in for repairs, the brakes, curves, grades and momentum causing unequal wear of both flanges and rails in the way I have mentioned. It has been suggested that the evil might be remedied by turning the cars occasionally end for end, but the true remedy is in turning the trucks from time to time. In this way the flanges may be made to wear uniformly, and other things being equal, all the wheels of a truck will reach the worn-out stage at the same time, which is a matter of economy.

Sharp flanges, no doubt, cause many of the unexplained derailments that occur, and when no other cause can readily be assigned for the ditching of a train, it is safe to charge it to that. A flange in good condition will pass safely over deffective rails, bad joints and track out of repair generally; whereas a flange somewhat worn is liable to "catch on" to a slight defect and leave the track. Worn flanges are, moreover, destructive to rails and track fixtures, and it is false economy to allow a badly worn flange to run a trip when it can possibly be avoided. As to the wear of rails, the same forces that crowd the flanges against them cause more abrasion to rails on curves that are peculiarly located, than on others of same radius on levels or where there is no slowing or stopping. When trains are running at ordinary speed without being checked, the elevation of the outer rail will protect rails and flanges from abrasion in a great measure, but as soon as brakes are applied, momentum and gravity set to work to grind out rails and such of the flanges as are most forcibly thrown against them. This may account for rails wearing faster on some curves than on others; and that the slowing of trains on curves is exceedingly liable to cause derailment, appears from what has been said above.

WM. S. HUNTINGTON.

Railway Traveling in Mexico.

The following is a portion of a letter written from the City of Mexico by a correspondent of the Boston *Herald*:

"The station of the Mexican National Railway is out at the suburb known as La Colonia, in the midst of the level meadow bordering the Grand Paseo, and something like half way out to Chapultepec. The present station is a temporary affair, and the work on a permanent structure has not yet begun. A handsome train is in waiting on the narrow-gauge track. The cars are dark in color, and are inscribed 'Ferrocarril Nacional Mexicano.' One accustomed to observe the details of railroading, notices that the rolling stock of the Mexican National is marked in three different ways, the locomotives being designated with the name of the 'Compania Constructora Nacional Mexicana' (Mexican National Construction Company), and the freight cars with the initials 'F. C. M. Y. L.,' which means Manzanillo & Laredo Railway, the name originally applied to the line. The Mexican National Construction Company, which is building the line, operates it until it is turned over to the railway company, and for this reason, I suppose, the locomotives bear the name of the former. The locomotives are remarkably powerful, being built expressly for the heavy mountain grades encountered on this part of the line, upon which probably the most difficult engineering problems of the entire route have been encountered. With enormous boilers, they look doubly powerful upon their small narrow-gauge wheels, and appear like railway giants in contrast to the handsome little passenger coaches which they haul. These coaches are divided into first, second and third class as nearly every thing is in Mexico. The first and second-class coaches are alike, with the exception of the seats, which are plush-covered in the former and leather-covered in the latter. In fact, one is inclined to make the criticism that they are too much alike, and that there should be more distinction in order to induce people to take the former for the sake of comfort. The third-class coaches have no monitor ventilators, and have a double row of hard benches extending up and down the center as well as along the sides.

"The train starts out at a lively pace—much quicker than one is accustomed to on narrow-gauge lines—and which one would hardly expect from such a short-legged locomotive, so to speak. Indeed, the rate of speed on Mexican railways appears to be much greater than on railways in 'the states' west of the Missouri River, but the running time is about the same, in consequence of the long waits at stations.

"We are soon rumbling through a rocky gorge, and are now well among the mountains, crossing dizzy-looking trestle-works and winding hither and thither as we steadily climb. The track is well laid, and an army of workmen are thoroughly ballasting it. The curves are sharp, but perfect in construction. At times the position of the train reminds one of a dog chasing its tail.

"The mountain sides are carefully cultivated high up the steep slopes, and there is none of the traditional American roughness in the noble landscape. The little squares are divided by bristling hedges of the maquey, the dark lines of which separate the delicately diverse tints made by the various crops. These tilled patches do not degrade the landscape, for immense tree-clad heights tower in solemn grandeur above and around.

"High up on the opposite slopes of the valley the iron way runs its slanting lines. Here we are in the region of the live oaks, the encinal, but just across and above, over there, the railroad cuts its way through the dark ranks of tall pines. The vista broadens as we ascend. The branching valleys widen their crooked furrows, and, as the train winds its way upward, glimpses of the distant plain are caught over the heads of the environing hills. A gleam of water also appears through a gap in the mountain we have passed, and at last, as we round a high point, the great basin of the valley of Mexico is spread out before us and below us, and it seems as if the whole world lay at our feet. There is the great sheet of Lake Texcoco glistening in the sunlight, and near by is the capital in a vague, level mass of buildings. A ring of mountains walls in the plain, and above them all, on the opposite horizon in the southeast, towers snow-crowned Popocatepetl, so high that his head seems to be almost half way to the zenith. It gives one a new conception of mountain sublimity.

"Leaving this scene behind us, we enter a tunnel and are soon out on the open divide, the highest point on the line, 3,558 meters, or 11,673 feet above the sea level. Here it seems as if we might be in New England. Broad and gently undulating glades are bounded by dark pine forests, covering the surrounding summits and standing, not open and park-like, as in the Rocky Mountains and in New Mexico and Arizona, but growing densely, as along the Appalachian chain. The turf is as green, fine and rich as that of a New England May, and the deep soil is of inky blackness.

"At Salazar station on this upland there is the first chance to satisfy an empty stomach. I find a slate-colored liquid called coffee, dispensed by an Indian woman at a stand in the open air, but could trace no more resemblance in the taste than in the color. The accompanying roll, however, was palatable, so I next ventured to buy three appetizing looking tortillas, covered with *chile* of a tomato sauce aspect, and sprinkled with chopped onions. The flavor was really good, but it was unmercifully hot. A dog was standing by, looking wistfully up, after the manner of Mexican dogs, which can beat any canines I have ever seen in a beseeching expression. I threw a piece of the tortilla to him, expecting to see a circus act in the way of rolling in the grass and a pawing of his nose, but he bolted it as if it were the most tempting of morsels and looked hungrily up for more. So I threw him the rest in reward for the example he had given of the result of early training, or, more likely, of an appetite inherited from a long line of *chile* fed ancestors.

"The beauty and grandeur of the scenery—which makes this line vie with the Vera Cruz in almost everything except the glorious changes from the tropical vegetation to that of the temperate regions—continues on the down grade toward Toluca. At a point called Dos Penas (Two Rocks) there is a beautiful passage through a ravine with a steep, pine-clad mountain wall rising above on one side, the woods filled with moss and fern-clad rocks, while on the other side cascades tumble down the wild gorge. The passage under a high stone bridge which carries the Jajalpa aqueduct across the track is another notable point. As the road winds down the mountains, another broad and level valley spreads out like a vast emerald lake, for, as far as the eye can see, it is an expanse of growing maize of the loveliest green, with here and there an island-like town nestled amid the fertility. The maize is planted in such close rows that it seems a wonder that they can get any crop from it, but perhaps the rich volcanic soil makes up for this crowding."

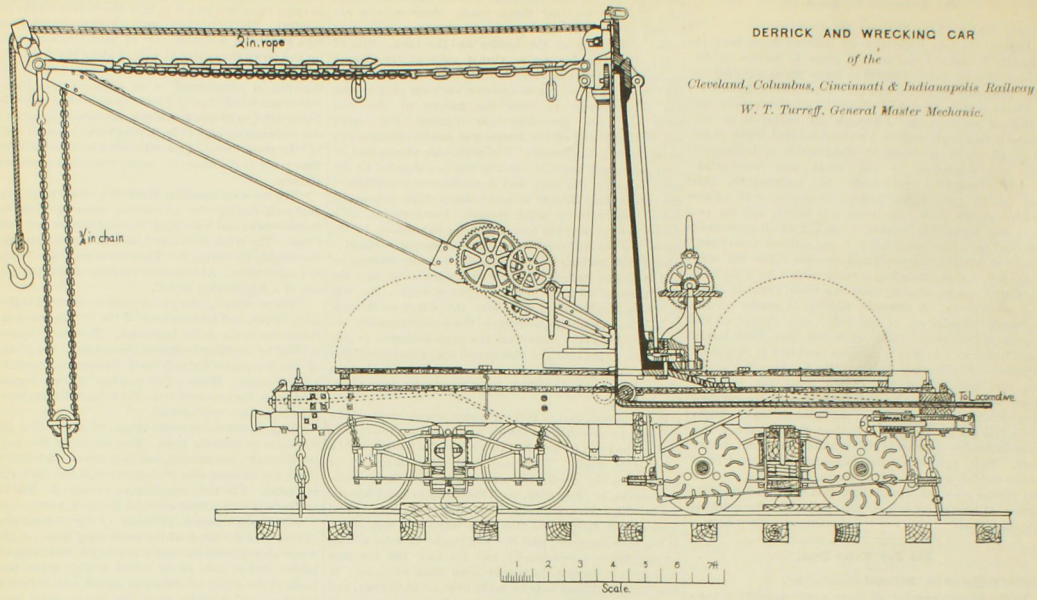
THE Virginia Iron Works, at Norfolk, Va., are the largest shops in the South engaged in the building of locom otives Although comparatively a new concern, it has already turned out some twenty locomotives, which are said to be equal to any built at the North in respect to interchangeability of parts and excellent workmanship.

DERRICK AND WRECKING CAR

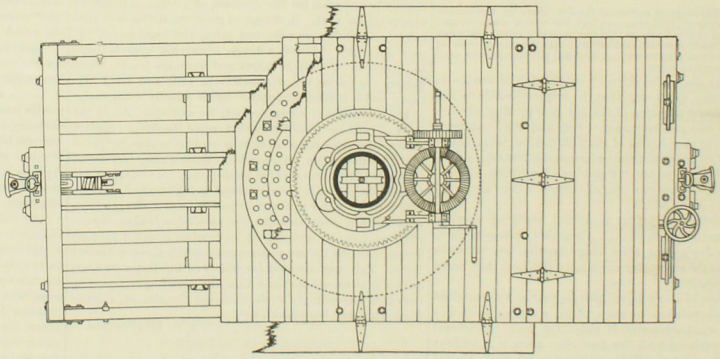
of the

Cleveland, Columbus, Cincinnati & Indianapolis Railway

W. T. Turreff, General Master Mechanic.



Side and Sectional Elevation.



Plan.

DIMENSIONS.

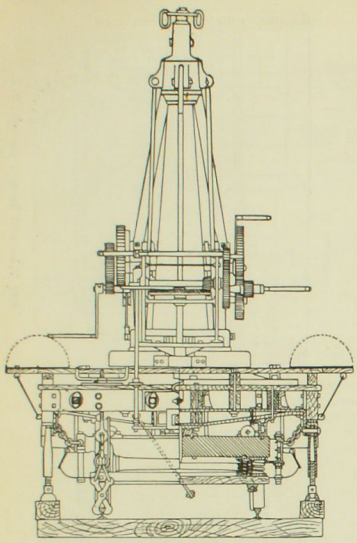
Length of body frame	20 ft. 0	in.
Width of body frame	8 " 9	"
Side sills	12 × 4½	"
End sills	8 × 6	"
Intermediate floor timbers	8 × 4½	"
Center floor timbers	8 × 4½	"
Intermediate floor timbers apart	10	"
Center floor timbers apart	8½	"
Length of hinged side platform	11 ft. 0	"
Width of hinged side platform	12	"
Width of car floor	9 " 0	"
Center to center of trucks	10 " 4	"
Center of truck to outside of end sill	4 " 10	"
Top of rail to top of car floor	3 " 10	"
Top of rail to center of draw-bar	2 " 9	"
Top of rail to top of derrick post	15 " 8	"
Top of rail to top of hinged side platform	4 " 4⅝	"
Center to center of arch bars, transversely	6 " 3	"
Length of windlass hand crank	1 " 6	"
Length of swing motion hand crank	14	"
Distance between cross-frame tie timbers	12	"
Cross-frame tie timbers	4 × 14	"

One of the advantages claimed for this car over the ordinary wrecking derrick car, is its length, with mast in the center and boom reaching out a sufficient distance to admit of its being used at either end, thereby avoiding the necessity of turning the car round. The gearing for swinging the boom helps to facilitate the work when handling wrecks. The four swing-jacks under body-bolsters prevent the car from tipping. The device for engine hoist with rope running through the mast and under body of car in line with, or a little above draw-bars, instead of running under spring-plank of trucks as in the old style, secures the advantage of a direct pull with engine.

In connection with the subject of derrick car construction, it is contended by some that a 30-foot car, with the derrick at one end, is very advantageous in many cases. A much heavier load can be lifted without the use of a guy-rope or rail clamps, the weight of the car and its load acting as a counterweight. With a derrick in the center of a short car the overhanging boom and short wheel-base give the load hanging from the boom an immense leverage to lift the car from the rails, and a guy rope from the top of the derrick is necessary with comparatively light loads.

It is now considered the best practice, to locate a car having a derrick on the end, at every 75 miles on the line or thereabouts, and when a wreck occurs the derrick cars at the ends of the division are sent to it with the derrick end toward the wreck. This follows from the fact that a wreck can always be more expeditiously handled with two derrick cars than with one, and when two are used, the placing of them with the derrick end toward the wreck, gives them much greater advantages than two with the derrick placed in the center, as they will lift much greater loads with no fastening, and will also swing much further from the end of the car. This latter feature is very essential in handling a box car body. The car shown in the engraving is fitted with an extra rope to be pulled by the engine. This is hardly necessary, from the fact that the windlass has a fast and slow speed for light and heavy lifts, and as the quick speed will lift from 4 to 6 tons very quickly, and the slow speed from 15 to 18 tons, and as the rope leading to the engine will not lift over 4 tons if an ordinary eight-wheel engine is used, it will not pay to use this rope. That is, the tractive force of an ordinary eight-wheel engine would be about 10,000 pounds, but a large percentage would be lost by the sharp turn around the small pulleys over which the rope is led. It would also be better to place the heavier hook at the end of the windlass block, instead of on the end of the rope, as the former will lift much heavier loads and would necessarily need the stronger hook. Another feature of this car is the geared arrangement for swinging the boom. We do not think this is necessary, because the boom is not well calculated for a transverse strain, and owing to the leverage of a load hanging from the end of the boom, it would be difficult to swing anything but a very light load. The most expeditious mode of picking up a car or load with a derrick of this kind, is to take the weight by means of the windlass, as it is powerful enough and always ready, and does not require the use of an engine, which is limited, unless a block and tackle is rigged, to a lift of about four or five tons. To swing the load toward or on the track, a rope simply hitched to the car with ten or fifteen men on the car end, or a pair of blocks and tackle hooked to the rail, and the car will accomplish the result in much less time than with the geared swinging arrangement, which at best is limited to but very light loads. A much better disposition of the rope would be to lead it over a block placed close down to the rails and hung from beneath the car frame. If it were necessary then to drag a car to a track some distance from it, as is frequently the case, the rope passing around this block, and led beneath the car to an engine or pair of blocks and tackle, would prove a very convenient arrangement, instead of having to chain a block to the track. That is, the block would always be in position for use, and the wheel flanges pressing on the whole length of a rail, would give a splendid anchor.

THE Toledo, Cincinnati & St. Louis (narrow-gauge) road has passed into the hands of a receiver. Mr. E. E. Dwight, the new receiver, was the General Manager of the road at the time the appointment was made, and has within the past few years filled many important and responsible positions in railway service.



End and Sectional Elevation.

Master Car Painters' Association.

SECRETARY'S OFFICE, KENT, OHIO, August 15, 1883.

The Fourteenth Annual Convention of this Association will be held at Baltimore, Md., opening on Wednesday, September 19, 1883, at 10 o'clock A. M. The headquarters of the Association will be at the Carrollton Hotel, where the Convention will also be held. The location is central and the house first-class. Special arrangements have been made for the meeting, and a reduction of rates to $2.00 per day secured to delegates. Those desiring to engage rooms will apply to the hotel clerk five days previous to the meeting. Foremen of Car and Locomotive Painters throughout the United States and Canada are cordially invited to attend the convention. Members of committees and delegates are requested to take notice of the subjects named below for consideration, and come prepared to give their practical views on the several questions, which, being few in number, will give opportunity for a thorough discussion on each. Those unable to be present who have reports or papers to lay before the meeting, will please forward them to the Secretary before September 15. The annexed subjects will come before the Association during the session, when, after being introduced by the members whose names are attached, they will be open for general discussion:

1. *Will the Loss of the Earnings of a Passenger Car while in the Shop for Re-painting be Compensated for by the Value of Repairs done to it?*—Affirmative, C. F. HARRAL, Kansas City, St. Joseph & Council Bluffs Ry., St. Joseph, Mo. Negative, F. S. BALL, Pennsylvania R. R., Altoona, Pa.

2. *What are the Advantages, if any, of Wood over Muslin for Car Head Linings?*—E. L. FETTING, New York & New England R. R., Norwood, Mass.

3. *The Benefits of Association as Applied to Master Car Painters.*—R. MCKEON, New York, Pennsylvania & Ohio R. R. Kent, Ohio.

4. *The Value of the Repeating Process of Varnishing in the Light of Another Year's Experience.*—JOS. MURPHY, Louisville & Nashville Ry., Louisville, Ky.

5. *Can a Passenger Car be Painted in Less Time than Thirty Days to Insure Durability, and if so, by what Method?*—D. D. ROBERTSON, Michigan Central R. R., Detroit, Mich.

6. *Is there any Difference in the Durability of a Passenger Car Painted in the Summer Months and one Painted in the Winter?*—J. C. STOUT, Union Pacific Ry., Wyandotte, Kansas.

7. *A Few of the Causes of Unsatisfactory Results in the Paint Shop.*—A. J. BISHOP, Cleveland, Columbus, Cincinnati & Indianapolis Ry., Cleveland, O.

8. *Testing of Varnishes; Suggestions and Questions.*—GEO. GLENNY, Grand Trunk Ry., Brantford, Ont.

9. *What is the Best Material for Painting on Tin, Galvanized Iron or Steel, to Insure Durability?*—NELSON NEHER, Wabash, St. Louis & Pacific Ry., Springfield, Ill.

R. MCKEON, Secretary.

D. D. ROBERTSON, President.

Inside Finish of Passenger Cars.

In the construction and finish of the inside of passenger cars much improvement has been made within a few years, but all advances in this direction are necessarily limited, on account of the form of the car itself not being susceptible of change. We can do very much, however, in satisfying the mind and pleasing the eye, by a judicious exercise of our knowledge as painters and decorators. True it is, as before remarked, we have but a small space to work on—a few panels and the head-lining—but the greater are the opportunities for intelligent effort and skillful manipulation, and right here I would remark that the nearer approach we can make in the finish of the inside of a car to that of a sitting-room or parlor, the more restful and satisfying will be the effect. Those who can afford to travel usually enjoy refined surroundings at home, and it is this class we endeavor to please, while those not having this refinement of taste are benefited by acquiring it through this channel. Acknowledging this as true, then we have a good rule of guidance in finishing, decorating and furnishing our cars, for if a large number of those who use the cars are deserving of our efforts in their behalf, as being persons of refined tastes and judgment, then their tastes should be consulted, and this is exactly what is being done by the most advanced railway managers, and is what governs the construction and furnishing of their cars, in the conveniences, interior wood work and general finish; in other words, whatever is the prevailing fashion in wood work, upholstery or decoration, to be found in the houses of the wealthy and refined, is followed, as nearly as it can be made applicable, in the interior finish of a car. In the treatment of the ceiling or head-lining the color should not be rendered so principal as to diminish by its beauty all other powers of work on the mind, but should be subordinate to the general design throughout. A habit that used to prevail of painting clouds and sky on ceilings, and festooning with flowers interspersed with peaches, with here and there a little cupid a-straddle, or engaged in a trapeze performance, has happily disappeared, although the fictitious architectural panels, medallions, vignettes, etc., have not yet been entirely abandoned, as they should be, being untrue and unnecessary to the attainment of the most desirable effects. Ornaments of whatever description in fictitious relief are objectionable, as is also graining and "marbling," which, being falsities, should be condemned. It is no more legitimate to make pieces of earthen-ware look like basket-work or to make an iron coal box or water cooler look as if made of wood, than to paint an imitation stucco medallion or molding on a ceiling.

For those not having the knowledge required for polychrome decoration, that of monochrome offers more satisfactory results with less liability to error. First determine the general tone it should have when complete, as for instance, a neutral green, then proceed from a dark tone for the ground to a lighter tone for the lines, and still lighter for the leaves or ornament, introducing a medium tone for the stems of running vines, and a judicions use of gold leaf will give life to the whole. Care must be taken, where stained glass is used in the deck, that the colors of the glass are in harmony with the colors on the ceiling.

In the treatment of the wood work of the car, if of hard wood, care should be taken to make it as uniform in color as possible by the aid of a stain. This is necessary wherever a light and dark piece of wood are joined, commencing at the joints and gradually blending it off; by so doing it will not be necessary to stain the whole length of the piece. For this purpose the following stains for darkening answer admirably: A mixture of extract of logwood (solid) and red sanders for mahogany, and a solution of bichromate of potash (one ounce dissolved in two gills of boiling water) for oak and ash or chestnut. If it is desired, any dark spots can be bleached by the application of a strong solution of oxalic acid in hot water, to which is added a few drops of spirits of nitre. The wood should then be filled with one of the many good fillers sold for the purpose, using a broad-bladed, square-pointed knife to press it into the pores of the wood. Some fillers will not admit of this treatment, however, notably those made from or largely composed of silex, which, being extremely hard and sharp, wear the steel and discolor the filler, leaving dirty streaks on all light-colored woods. Such fillers should be worked by means of a wedge-shaped piece of hard wood. After filling, the work should stand twenty-four hours, when a light sand papering will be necessary to remove any surplus filler that may have been overlooked; a light coat of white spirit shellac may then be applied, which should also be sandpapered close when dry; then apply two coats of inside rubbing varnish, and finish by rubbing down with pulverized pumice stone of medium fineness and water, and when rubbed, oil over with olive oil and wipe dry, leaving an egg-shell gloss. If there are any raised panels or other surfaces that it is desired to polish, piano polishing varnish should be used on surfaces which do not allow a high lustre with the ordinary rubbing varnish. Very great care should be exercised when rubbing where there is any carved ornamentation, so that the sharply defined lines and edges are not rounded off and disfigured, and the same caution is required when filling, that none be left in the interstices to become hard. A very fine effect is produced by simply giving a light coat of linseed oil to the carving and afterward a coat of flat varnish, that is, a varnish that dries with an egg-shell gloss. This obviates the necessity of rubbing down with pumice stone, and lessens the danger of injury to the work through careless or unskillful workmen.—*"Occasional" in Coach Painter.*

CHAS. W. PICKERING & CO., of Philadelphia, car spring manufacturers, have opened a branch office in the Boreel Building, 115 Broadway, New York, of which Mr. A. L. Rowe of the latter city is the manager.

Receipts and Expenses of the Chicago Exposition.

The following is published as an official statement of the receipts and expenditures of the Chicago Exposition of Railway Appliances:

Space fees	$25,921.97
Entrance fees	5,115.00
Competition fees	6,490.00
Exhibitors' and employés' season tickets	6,779.00
Privileges (miscellaneous)	2,990.80
Electric railway	2,649.60
General admissions	61,919.10
Total	$111,865.47
Expenditures:	
Advertising	$8,570.67
Printing and stationery	6,107.08
Furniture and fixtures	622.57
Pay rolls of superintendent	4,767.47
" " secretary	4,298.64
" " treasurer	2,525.80
" " police	4,764.05
" " firemen	700.03
Annex and maintenance	38,039.42
Addition and improvements to main building	17,751.10
Electric railway	13,659.98
Electric lighting	4,000.00
Foreign exhibits	3,475.26
Preparing for and maintenance of machinery	11,042.60
Unclassified and miscellaneous	14,101.24
Total	$135,326.01
This leaves a deficit of	$23,460.00
To the above statement should be added the following items:	
Unpaid bills July 27	$7,000.00
Cost of medals	7,000.00
Total	$14,000.00
There are still uncollected assets as follows:	
Lumber to be sold	$3,000.00
Railway tickets	3,000.00
Electric railway	7,500.00
Total	$13,500.00

Adding these (estimated) assets, and deducting the above additional expenses (also estimated) makes the net deficit $23,960 in all.

A Train for Dudes.

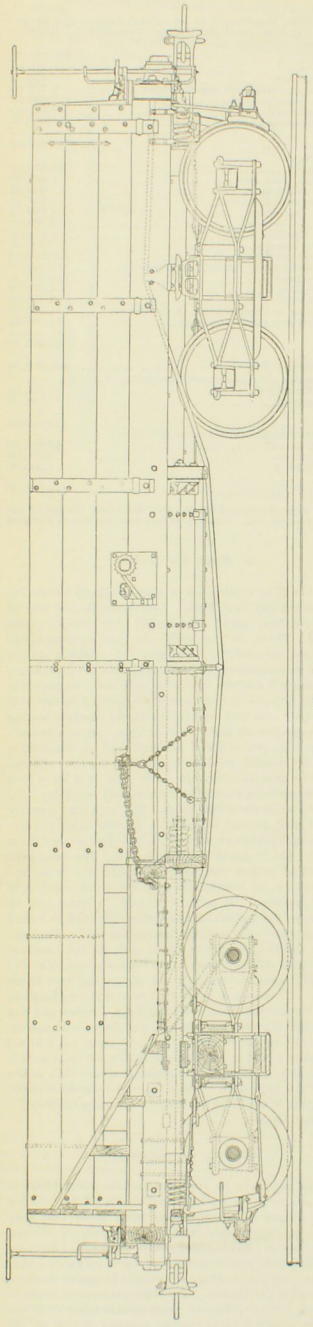
There is talk of putting on a regular English train between Boston and New York. Everything in the way of luxury, comfort, speed and safety has already been perfected. There are no such cars and engines in the world as the consolidated road runs, yet, wishing always to supply an unsatisfied public, the experiment of running a train of English coaches has been agitated. English engines with no cabs and one pair of eleven-foot drivers will be imported; also first-class compartment coaches, seating eight persons in each part or twenty-four persons in each car. The high rate of speed accomplished in England is attained by running small trains, so here but four of these cars will be used on each train. One train will leave New York and one from Boston simultaneously each day, and make the run in about five hours. The train may possibly carry the mail, paying a pound a minute to the government for each and every minute's delay—just as they do in England. The "guard" will pass along the outside of the train and collect the tickets through the windows. There will be no ventilation and not much comfort to speak of, but then "it will be English." There will be no water, no toilet room, and the passengers will be locked in and unlocked only at their destination—all so English! The fare will be about $20 or "four pun, me lad," and the portmanteaus will be "pasted," and not checked. The full fares and postal service will net something over $2,000 each trip. There are so many that go everything English, that it is expected that coaching clubs, English pug dog owners, polo players, fox hunters, and dudes will patronize and roll up the receipts of the new train. It will not be necessary to use any of the new $5,000,000 loan, as it is a known fact that anything brought over here that is English always pays well. One of the trains should be called the "Flying Wilde" and the other "Lightning Langtry."—*Bridgeport Farmer.*

Stealing Car Brasses.

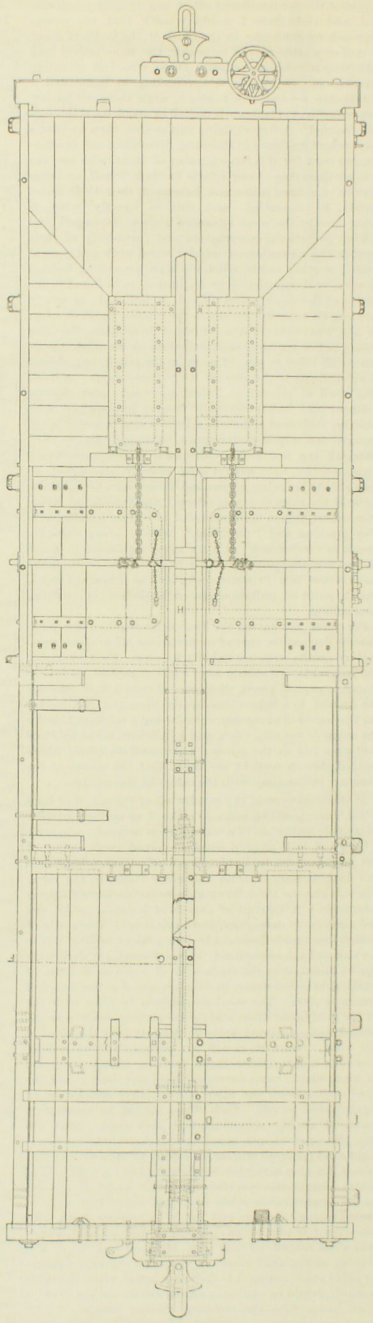
It would naturally be supposed that the journal brasses of a car truck are so well secured inside of the oil-box with the weight of the car resting upon them that they would be peculiarly safe from the enterprise of thieves. Yet it seems the light-fingered gentry have called mechanical appliances so well to the aid of their operations that they have been able to make a specially lucrative business out of stealing car brasses. The railroads having yards in Jersey City have experienced great trouble lately from loss of brasses, seldom a night passing without several of the cars being stripped.

A few nights ago a police sergeant made a raid in the yard of the Jersey Central and captured a man who was busy at his occupation of brass stealing. The thief was perfectly fitted out for the operations he carried on. A screw-jack, monkey-wrench, packing-hook and other conveniences of car repairing composed his kit.

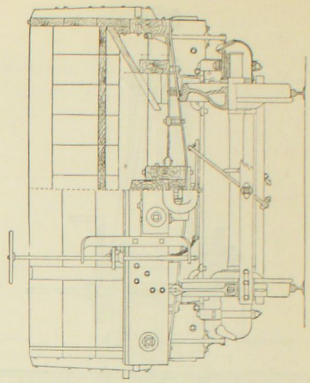
This kind of thieving is particularly dangerous and annoying to railroad companies. A train is made up all ready to start in the morning, every car having passed the repairs inspector as in proper condition for the road. During the night a thief sneaks round and steals the brasses. In the morning the loss is not discovered and the train pulls out, and is fortunate if it gets to the first stopping place without having a journal cut in two and the train ditched.—*American Machinist.*



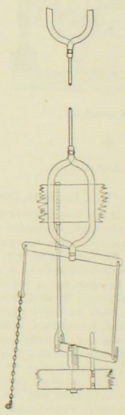
Side Elevation.



Plan.



End View and Section through D E.

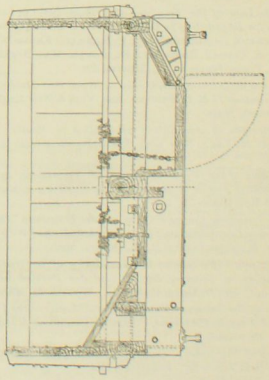


Brake Connection.

TWENTY-NINE FOOT HOPPER-BOTTOM COAL CAR.

New York Central & Hudson River Railroad.

Capacity, 40,000 pounds.



Section through F G H I.

DIMENSIONS.

Length over end sills	29 ft.	0	in.
Width over side sills	8 "	6	"
Length of sides	27 "	11	"
End sills	12 ×	5	"
Side sills	12 ×	4½	"
Intermediate sills	9 ×	4	"
Center of bolsters to outside of end sills	4 ft.	10	"
Center of bolsters to center of tie timbers	4 "	10	"
Drop doors, length	4 "	6	"
Drop doors, width	3 "	5	"
Height of car sides	2 "	6	"
Center to center of truss-rods	7 "	7⅝	"
Between sides of car	8 "	1	"
Truck wheel-base	5 "	0	"
Top of rail to bottom of side sill	3 "	1	"
Wheel gauge	4 "	7⅛	"

THE cost of stopping a train of cars is said to be from 40 to 60 cents. When the train is stopped by another train these prices become somewhat inflated.—*Courier-Journal.*

A GENTLEMAN from Florida thinks that all the railroads projected in that State will pay. "Florida," he says, "is rapidly becoming the truck garden of America, and in no other States are there lands that will produce the weight of freight per acre. In Georgia, the cotton lands demand only one car per season to every sixty acres cultivated, counting thirty bales to the car and a bale to every two acres. At Harris' Grove, in Florida, the demand for his eighty acres was for eighty cars, and Harris says that in five years the same eighty acres will call for 160 cars. This is from oranges alone. From vegetables the demand will be nearly as great, and the vegetables may be grown between the rows of trees upon the orange land."

THE older and faster the world gets, the more necessary it is to economize time. Here is a sample of the way the thing is done:

Chief Engineer Wainwright, of the Pittsburg, McKeesport & Youghiogheny road was recently presented with a handsome gold watch by the members of the Engineer Corps of the road. Mr. P. F. Brendlinger made the presentation, and the speeches were as follows: Brendlinger—"Here is a watch." Wainwright—"Is this a watch?" Brendlinger—"It is." Wainwright—"Thanks."

In the stereotyped press notices of these little affairs, the qualifying adjectives "handsome" and "valuable" might very properly be omitted, inasmuch as they are clearly implied when they have reference to a watch or tea set presented to a railroad man as a token of esteem.

Street Car Building in Chicago.

The *Northwestern Lumberman* says in reference to the building of street cars in Chicago:

The lumber mainly used is ash. It usually forms the body of the car, going in the carlines and the posts for sash, doors or windows, ribs, rails, etc. The side sills are pine, and the cross sills and end sills oak. The latter lumber is also made into the platforms and head blocks. Hickory and maple are also put into platforms. Whitewood forms the panels, roof, letter-boards, guards, etc., and is used for interior finish, in connection with walnut, basswood being sometimes substituted. Walnut is used in blind frames, with slats of maple.

The pine that is used is the Georgia long-leaf variety, which best answers the purpose for which it is designed. Norway is not used, because it is not equal to the emergency. It will not stand continued exposure to the atmosphere, and gives less resistance to strain. Street cars can be neither heavy nor bulky, and it is necessary to use timber that can stand the service and not occupy too much space. The dimensions of Norway that would be sufficient to do duty would be too large, together with a natural tendency to check and rot. In railway cars large dimensions can be used, and where the Norway is covered or protected it is all right. The Georgia pine is credited with several virtues. It has both strength and endurance, a comparatively slight sill of that material standing all strain readily, and not so easily succumbing to outer influences, though placed where there is constant exposure to moisture. Georgia pine is also put into floors. Some makers of cars will not use pine in any part, preferring oak for sills, and hardwood floors are also put in by some.

Cars are of various sizes and styles, according to the ideas of their designers, and, as in railway car supplies, the materials are cut to order and furnished on demand. The size adopted by the West Side Company of Chicago is 16 feet over all, and six feet one inch in width, with open cars 24 feet over all. The cars of the North Side are similar. The South Side Company formerly built 14 and 16-foot cars, but has now adopted a length of 21 feet, with a width of seven feet. A good deal of 4x8 pine stuff is used, which, when ripped, furnishes a 3½x4 sill and a plate for the upper part of the frame, 4x6 sills being put into grip cars. The bodies of open cars are of oak.

There is a considerable waste in a street car, because of so many curves in the outlines, requiring an indefinite number of small and irregular pieces. An averaged-sized car requires about 2,000 feet of lumber—some more and some less.

Walnut is used in seat panels, in the ceiling and in other ways of interior trimming. Gum is coming into favor in this way also. The high price of walnut has suggested that some other wood could be more economically if not as successfully employed. The lumber that goes into a car costs all the way from $20 or $25 to $100, and there is some reason why builders should be in search of a cheaper wood than walnut. The South Division Company has recently completed a batch of 50 cars finished with gum. As a finishing lumber it is well known that the use of gum is feasible because it can be held in place where thin surfaces are handled.

The gum for car trimming is sawed and dressed to the thickness of one-fourth and one-sixteenth inch, and there is thus little trouble from warping. The whitewood of Tennessee and Kentucky is preferred, and the ash used comes largely from Ohio and Indiana. All of the lumber used needs to be of the best quality and thoroughly seasoned in the air. Kiln-drying is held to injure the lumber for such purposes, detracting from its life and vigor, and hence impairing its strength and durability. A well-built car, with reasonable treatment, will stand from 10 to 15 years of service, with periodic repairs, an oak platform lasting some three years.

Heating Railroad Cars.

In a lengthy article on this subject, the *Railroad Gazette* recommends, as preferable to the present style of stoves now quite generally used, the substitution of cylindrical stoves made of boiler iron, the longitudinal seams welded instead of being riveted, and the top and bottom heads welded in like the reservoirs of the Westinghouse brake. The inside could be lined with fire brick, or it could have a cast iron fire pot. It should then be bolted down, not with a few lag screws, but with strong three-quarters or seven-eighths inch rods passing over the top of the stove and down through the floor, with proper nuts and washers underneath the sills. In order to protect the sides of the car from the heat of the stove, it could be inclosed with a cylindrical casing made of tank iron, with a liberal space, say six or eight inches, between it and the stove. This might be open at the top and bottom, and the lower edge should be raised and have an open space between it and the floor of about six inches. The effect of this would be that the air between the stove and the casing would be heated and would rise and thus draw in the cold air next the floor, which in turn would be heated and would also ascend. Above the stove, and in the end of the car, above the end window, a suitable ventilator could be placed, with slats which incline upward, so that the current of cold air as it enters would be directed upward and would mingle with the ascending current of hot air from the stove, and would then be distributed through the car.

This arrangement, it is believed, would heat the car very effectually, and with a reasonable degree of uniformity; it would give good ventilation, and it would be much less liable to set the car on fire in case of accident than the ordinary heaters are, and lastly it would be cheap and simple. It is not claimed that the plan has all the advantages which some of the other systems possess, but it is believed that cars could be heated very satisfactorily with such an apparatus.

Poor's Manual of Railroads for 1883.

The current number of the Manual has just been issued containing the details of railroad operation in the United States for the fiscal years of the respective companies terminating in 1882. The mass of information it contains is too ponderous for us to deal with or convey any idea of except in a very brief and general way. A glance at the present volume makes it apparent that the unfavorable criticisms elicited by that of last year have had the effect of greatly improving the present one. The evidences of laborious and painstaking compilation and arrangement of the statistics of our vast railroad system are particularly manifest in the "Introduction" to the volume, which covers 108 pages, and contains tabulated statements showing the length of each road, its equipment, share capital, funded and floating debt, cost of road and equipment, length of lines operated, traffic operations and earnings, and length of each line constructed in 1882. The comprehensive completeness of these tables surpasses any thing of the kind that has ever been published heretofore. They contain a mine of information which will be appreciated by every student of railroad progress, and all the more because the arrangement is such that any particular data can be easily found. The correctness of these tables, in their immensity of detail, we can not of course vouch for, but we are willing to take them on trust until they are shown to contain material errors. The body of the Manual contains a large number of well executed tinted maps, which is a new feature.

We copy the following figures of mileage, operation and equipment for 1882:

Mileage at close of 1882	113,329
Miles completed in 1882	11,591
Average mileage operated	107,158
Gross receipts from passengers	$202,140,775
Gross receipts from freight	506,367,247
Gross receipts from other sources	61,848,734
Total gross receipts	770,356,756
Total net earnings	310,682,877
Gross earnings per mile	7,188
Net earnings per mile	2,899
Dividends paid	102,031,434
Total number of passengers carried	*289,190,783
Total number carried one mile	6,834,048,765
Charges per passenger mile (cents)	2.80
Total tons of freight moved	360,490,375
Average tons per head of population	7
Number of tons moved one mile	39,302,209,249
Average charge per ton per mile (cents)	1.2
Population to one mile of road	481
Total number of engines	22,114
Total number of passenger cars	15,551
Total number of baggage, mail and express cars	5,366
Total number of freight cars	710,451
Miles of steel rails in track	66,691

* Not including 86,161,029 carried on the New York Elevated roads.

Rapid Railway Building.

The Montreal *Gazette* says: The rapidity of construction on the main line of the Canadian Pacific Railway in the first week in July is without parallel in this or any other country. On Saturday the rails were laid upon six miles of road and in the week no less than 25.86 miles, exclusive of sidings, were completed, an average of about 4½ miles per day, the highest ever obtained. The record is as follows:

	Miles.
July 2	4.02
July 3	4.78
July 4	3.62
July 5	3.62
July 6	3.90
July 7	6.02
Total	25.86

The track is now completed for a distance of 728 miles west of Winnipeg, of which 161 miles have been constructed this season as follows: April 18 to 30, 17.58 miles; May, 51.97 miles; June, 65.69 miles; July 1 to 7, 25.86 miles.

Getting Even With a Hog.

One day last week an incident occurred on the Eastern Railroad between Boston and Lynn which deserves record. A very well-known citizen of Lynn returning from Boston found the cars very much crowded, and in fact only one seat not occupied by a passenger, but utilized by one to hold a valise. Our fellow-citizen, whom we will call Mr. B., quietly lifted the baggage from the cushion with a view to setting it on the floor and filling the seat himself. "What are you doing there?" sharply exclaimed the occupant of the inner seat; "that belongs to a friend of mine." "Never mind your friend," replied Mr. B., "I will take care of him when he comes." Both parties "ceased firing" at this point, and the train moved on to Somerville, but no "friend" claimed the valise and seat, and Mr. B. reminded his fellow-traveler of that fact, who said, "Well, that gentleman will be here soon." But as Everett and Chelsea were passed, and there was no change in the situation, Mr. B. concluded to make a movement. He accordingly left his seat, and walking to the rear of the car said to the conductor: "There's a suspicious character in this car. A gentleman has left his valise in that seat and I believe that man means to steal it, and I want you to stop him." The conductor replied: "Yes, I've seen that class of gentry before, and I'll attend to his case;" whereupon Mr. B. returned to his seat. As the train slowed up at Oak Island, the traveler gave signs of preparing to leave the car, observing which, the conductor approached. As was expected, the traveler grasped the valise, but the conductor interposed, ordering him to drop it. He indignantly refused, saying: "It is mine?" But Mr. B. here said: "You're a liar, sir! you told me it belonged to a 'gentleman' who was to occupy a seat." The traveler retained the valise, and attempted to go, but the conductor sternly said: "If you don't leave that I'll arrest you! I will take it to headquarters at Boston, where you can have it by proving property." The Oak Islander, beaten at all points, was obliged to surrender on the terms offered, and left the train—a specimen of a baffled and disgusted hog (that's the word). It is, perhaps, needless to thank our friend Mr. B. in behalf of decent travelers everywhere for his skillful and courageous disposal of a typical railroad nuisance.—*Lynn Transcript.*

A Singular Coupling Accident.

William Miller, one of the yardmen in the employ of the Chicago, Milwaukee & St. Paul Railway Co., had his forearm broken on Friday, while trying to couple two cabooses. Doctor Ballard was called to set the injured arm. The way in which this accident occurred was very singular and caused much comment among railway employés, who gathered in a knot about the caboose to see how it was done. Most accidents in coupling cars are caused by the cars coming together and catching the unfortunate man between the draw-bars, but in this instance the man's arm was broken by cars moving away from each other. Miller is one of the most careful and skillful men in the yard, a man who took no foolhardy chances. He was trying to couple the caboose, but the side link would not slide into the bar. He put his arms around the iron stanchions of the adjoining cars and lapped his hands on the inside of the vertical board next to the stanchions. He then tried to kick the link into place, but it did not yield, so he told the engineer to go ahead a foot. The level was thrown over and the engine moved up a trifle, but Mr. Miller found out that he could not readily pull his arms out of their position, so something had to give way or the man be pulled in twain. The bones of his right forearm broke, releasing it from its position. The brakemen say they frequently hold themselves up between the cabooses in the same way, but they have learned a new lesson. This accident could not happen between two flats or box cars, as they have no platforms with iron railings.—*La Crosse (Wis.) Republican, Aug.* 11.

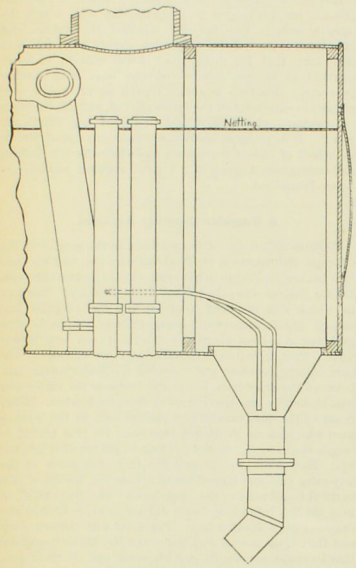
The Speed of Railroad Trains.

A commercial traveler, who is well versed in all matters pertaining to railway travel, gives the following rule by means of which any person riding in a car can tell how fast the train is going. He states that the telegraph poles are located precisely ten rods apart, and thirty-two of these poles, consequently, make a mile, so that in order to find out how fast the train is going, all that is necessary is to record the time, and when you have counted thirty-two telegraph poles you will have gone a mile, and your watch will tell you the time taken to cover the distance. The gentleman furnishing this information has made repeated tests of the running time of trains over the various rail roads of New England on the basis described above. On riding over the Central Vermont Railroad, between Randolph and White River Junction, he at one time went thirteen miles in twelve minutes, and the average number of rods per minute for the entire distance between the above-named places was 310. On the Northern Railroad the number of rods covered per minute was 300, and between Plymouth and Concord, on the Boston, Concord & Montreal road, the number per minute was 280. By remembering these points, a railway passenger can tell at any time how fast his train is going, regardless of what section of the country he is in, as the telegraph poles are placed the same distance apart in all portions of the land.—*Cotton, Wool & Iron.*

ON Southern roads there are to be seen some freight car trucks of rather peculiar construction. One of this class of trucks has an immense elliptic spring, resembling an exaggerated locomotive driving-box spring, extending between the wheels and bolted to the journal boxes, the bolster resting upon its center, and the springs taking the place of arch-bars, thus performing a double function. This mode of construction is said to be very substantial and serviceable. There is also to be seen on some freight cars a draw-bar something like the draw-bar casting on the rear end of a locomotive tender-frame. From this casting two wrought iron bars extend back to the body-bolster, and passing through it so as to hold in place a spiral spring on each side of the bolster, one of which is for draft and the other for compression.

Origin of the Extended Smoke-Arch.

Now that the extended smoke-arch is coming into such general use, the question is frequently asked, who first invented it? This question cannot be answered with certainty, but from the date of the patent (1864) issued to I. H. Congdon, the present General Master Mechanic of the Union Pacific Railroad, and the remarkable resemblance of the device now in use to his, it would seem that the merit of the original invention is due to him. The accompanying cut is from a shop tracing made in the year above named. The clearing of the front end of sparks was intended to be automatic. Two pipes, one from each exhaust pipe, were bent as shown, so as to conduct a small portion of the exhaust steam into the hopper attachment, which ended in



a conveyer-pipe beneath the engine. When the front end has to be emptied a valve in the hopper was opened, and the current produced by the exhaust steam through the two pipes being more local in its effect than that of the exhaust through the nozzles proper, the sparks were discharged. The probability is, however, that the air which is liable to come in through the hopper when it is open would prevent the use of this method, as a small leak in the extended smoke-arch will cause the retained sparks to ignite and burn up the front end in a short time.

THE TRAVELERS' OFFICIAL RAILWAY GUIDE for August contains 572 pages, and considering the nature and quality of its contents, it is a publication which may justly be ranked among the wonders of this wonderful age—a characteristic product of railway growth and enterprise. Not one in a thousand, probably, who open its pages to see when a particular train arrives or departs, stops to give a thought to the enormous labor, the attention to the immensity of minute details, the vigilance and care necessary to secure correctness in every word and microscopic figure, and, above all, the thoroughness of the organization that is required to give completeness to each successive issue of such a comprehensive epitome of American railroading. Any thing short of completeness, or a very near approximation thereto, would destroy its usefulness, and this requisite is practically attained in this marvelous publication. The *Guide* proper, or time-table portion, occupies 416 pages of closely printed matter, while the remaining 156 pages, the larger portion of which is even more compact, are occupied with a variety of collateral information admirably arranged for easy reference, and which every business man has almost constant occasion to consult. The Index of Railway Stations, including about 30,000, occupies 46 pages, and although in "pearl" type, is in the last degree valuable as affording a kind of information which every body is in want of and which can not be so readily obtained any where else. The List of Old and New Roads; Railroads in Course of Construction; Passenger and Ticket Agents; Steamship Lines, etc., are all indispensable for reference.

In addition to these desirable features, the August number contains a general railroad map, arranged in such a way as to avoid the difficulty of unfolding, a trouble which every body has experienced in the handling of this class of maps. Instead of a large folded sheet, the map is given in sections upon single pages of reddish paper at the end of the book, with references at the top of each page to the pages where the adjacent territory may be found—an improvement in map arrangement that will be appreciated by all who have occasion to use it.

AT the shops of the Chesapeake & Ohio road at Huntington, W. Va., 14 engines are in for repairs, and 7 engines at the Richmond shops. At the last named shops a new 50 foot baggage car has just been completed. Yellow pine and poplar are largely used in car work at these shops, the latter wood especially for the siding of passenger cars, and the siding, ceiling and lining of baggage and express cars.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consinder of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondencee,etc., intended for insertion, must be received no later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and opies kept for sale, at the following places:*

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METALLIC CARS.

Since the close of the Chicago Exposition, certain of our contemporaries have been blaming master car-builders for their conservatism or lack of enterprise in not having exhibited for public inspection cars made of iron or steel. The Master Car-Builders' Association also comes in for a share of reprehension in not urging forward with energy and zeal the change from wood to metal. The claim is advanced that iron or steel will be used in car construction at no distant day, even from the humble coal car to the luxurious drawing-room coach. When the interests or prejudices of people lead them to desire a change in any practice or principle, they do not generally search long before finding plausible reasons for demanding what will satisfy their wishes. The iron and steel advocates are at this time solicitous for the safety of passengers, and they cannot perceive any means whereby travel can be rendered safe except by the employment of steel cars.

There are two sides to this question. Lumber dealers are probably interested in retaining the present practice, and it may be that those who take the lead in pressing upon railroad companies the desirability of abandoning wood as a building material, may be biased in favor of steel or iron by self interest. But if there is any class concerned in this matter which ought to be neutral, it is the master car-builders employed by the various railroad companies. Their interest is in the best, the safest, and consequently the cheapest material for cars, irrespective of whence it may come and of what it may be composed. Nothing that has yet been accomplished by iron or steel in the way of car building indicates any superiority over wood or even paper for general utility; and we certainly think the Car-Builders' Association acted wisely in refraining from pledging their influence in favor of a change which is yet experimental. There will be nothing lost by waiting till investigation and experiment prove what is really most suitable as a substitute for wood when that material becomes so scarce that it can no longer be used economically in car construction.

Only in one respect can the friends of steel make a decided point for that material over wood, and that is its immunity from taking fire in case of accident. We believe this danger from fire has been exaggerated, for where the floors of a car are filled with a non-combustible substance and safety stoves and lamps are used, the chances of a car taking fire are very remote. Metallic cars would not be absolutely free from this danger, as the lining would necessarily be of wood. As a car-building material, iron or steel has certain objectionable features which must not be overlooked. In summer metallic cars would have a tendency to be intolerably hot, for no amount of non-conducting material could prevent the heat of the sheets from being conveyed inside the car. In winter, on the other hand, the temperature of the metal would always be lower than the air inside the car, and continual "sweating" would ensue with all the discomforts of dampness and water-saturated lining. This condition of affairs would be calculated to reduce the life of a steel car considerably below the period usually calculated on. There is another objection to metallic cars which will occur to any one who has traveled on an empty tender. That is, the noise produced by the vibration of the iron sheets. Means of deadening this discomforting sound could probably be devised; but years of patient labor and experiment to overcome this and other objectionable attributes are required before the metallic car can be considered ready to fulfill its promised mission of superseding the wooden car.

We do not believe that there will be any sudden revolution in car-building. As lumber becomes scarcer and more expensive, metal, and perhaps paper, may be worked in gradually, the tools and building appliances being changed by degrees to meet the new conditions. Iron and steel have already worked into favor for trucks, but the adoption of metal has been a slow process, every step being accomplished after experiments made to ascertain the best methods of using it. Iron or steel sills may be the next step in progress, and other parts will follow on the metallic base when that becomes the cheapest medium; but we do not anticipate seeing the body of passenger coaches made of a material which conducts heat and cold so readily as does iron or steel.

THE CARLYON RAILROAD ACCIDENT.

One of those terrible accidents which stand out like black spots on our railroad annals, happened on the Rome, Watertown & Ogdensburg Railroad on the evening of July 28. A train, consisting of one coach, nine sleepers and one baggage car, drawn by two locomotives, was pushing along behind time in the midst of a driving wind and rainstorm. Near a small way station, named Carlyon, they came upon a car standing on the main track, and as the night was peculiarly bad for seeing an obstruction any distance away, the train was almost close to the car before the engineer perceived the danger. The train was probably running at a speed of 25 miles an hour when the obstruction was struck. When the first engine left the track, it turned on its side and lay diagonally across the line of rails. So powerful was the inertia of the unbraked train behind, that its shock pitched the second engine so forcibly ahead that it turned a complete somersault. The forward portion of the train was completely wrecked, several of the cars being torn to splinters. Nineteen persons were taken out of the ruins dead, four or five have died since of their injuries, and a large number of persons who escaped with their lives were badly crippled.

A combination of unfortunate circumstances united to render this accident particularly violent. The wind storm had blown the fatal car out of the side track immediately after a section foreman passed the spot. Just before reaching the obstruction, the fireman of the leading engine had opened the fire-box door, and the engineer happened to look at the incandescent glare which obscured his vision for an instant as he was approaching the car As it suddenly loomed up through the blinding storm, he called for brakes and reversed his engine, but the train smashed into the car with undiminished speed. The necessity of calling for brakes, which led to so many fatal delays before the automatic air-brake became a recognized factor of safety in railroad passenger travel, continues to day to be the warning of danger where two locomotives are engaged in pulling a passenger train. On nearly all railroads the train engine controls the air-brake, and when the engineer of the leading engine perceives danger, and he is in the best position to observe the necessity for a sudden stop, all he can do toward stopping the train is to call on the train engineer by means of the whistle signal. A second of time gained in the application of an automatic brake in the case of an impending accident will always result in materially reducing the destructive force of a collision or derailment, and the resulting destruction to life and property will be proportionally lessened. When

an engineer is accustomed to running with an air-brake his natural impulse on the first indication of danger is to apply the brake. The handle is turned quick as thought, and the brake at once begins to do its retarding work. A call from a second party is never so promptly heeded as when the danger comes direct to the eyes of the man who handles the brake. In the old hand-braking days, it was hard to get a brakeman to obey a call for brakes quickly by twisting on his brakes. He would generally look out first to try and see what was the matter. In the same way the engineer of a train engine inclines to look out before he applies the air in answer to a call from the leading engine. The truth of this has been demonstrated repeatedly. Its consequence sometimes is serious, and where two engines are used on a passenger train, provision should be made to make the leading engine do the braking. On several of our most important roads, the passenger locomotives have the brake pipes arranged so that either end of the engine can connect with the train brakes. Where this practice is followed there is no difficulty in connecting the first of two engines with the train brakes. Where engines are not equipped in this way, and the habit of double-heading passenger trains is in vogue, there should be no time lost in having air pipes run to the front of the engines, so that the brake may be controlled by the leading engineer. Double-heading any kind of train is dangerous, and should be discouraged. An estimable feature about American railroad operation, when compared with the practice in other countries, is the absence of double-heading. The policy of our railroad management has been to make locomotives heavy enough to take trains along without helpers; and in nearly all instances the inferior comparison for economy which our locomotives show beside European locomotives, is due to their greater weight and superior hauling capacity.

Although double-heading of passenger trains is objectionable and dangerous, it had not much to account for in the fatality of the Carlyon accident, for the train was running without a continuous brake, and the call to apply the hand-brake was as good from the front engine as it would have been from that attached to the baggage car. The evidence of the inquest showed that no brake was applied in answer to the call from the engine, a condition which generally comes about when a sudden emergency requires hand-brakes to stop a train promptly. Had the train been equipped with an automatic brake the loss of life would have been materially reduced, if not entirely avoided. The presence of good brakes are constantly making the difference between a slight accident, which scarcely reaches the public prints, and a wholesale carnage which terrifies the traveling public for weeks. A case in point happened on a northwestern railroad recently. Through a mistake in the time, two passenger trains running at night on a single track met as they were rounding a curve. Both the engineers applied the brakes and jumped. The engines were both very badly wrecked, and a weak show-car that happened to be in the train was severely damaged, but the rest of the train did not leave the rails. The master mechanic of the road, who was on the train, did not suppose that an accident had happened; he merely thought they had backed into a side track and struck the cars a little roughly. But for the retarding force of the powerful brakes, all the cars of the two trains would have been piled into a promiscuous heap. As the safe operating of our passenger trains depends almost entirely on the presence of good brakes, there is certainly grave responsibility resting upon the shoulders of those who run their trains without a continuous brake. Happily the roads which operate in this manner are few and far between, and the sooner they change their methods the better it will be for all concerned.

INDEPENDENT WHEELS.

Next to car coupling there is probably no mechanical problem pertaining to steam railway operation more attractive to inventors than that of an independent wheel movement; and it may also be said that the problem has probably been worked out to the utmost practicable degree of perfection. Yet there are no loose wheels or divided axles running on any of the steam roads, so far as we know; or, if there are any, the cases are extremely exceptional. It may be asked, Why is this? when some of these devices have been tested, and severely tested, in passenger train service without revealing any serious defects in practical running, but exhibiting on the contrary the most decided advantages in the matter of economy as compared with the performance of rigid wheels and axles. All railroad men would like very much to get rid of wheel sliding, flange wear on curves, spreading of track and sundry other things inseparable from the use of rigid wheels on rigidly parallel axles, but they do not seem to take kindly to any arrangement by which one wheel can revolve independently of the other on the same axle. And in this we think they are right. An independent movement necessitates either a loose wheel or a divided axle. There must be a loose joint somewhere which no inventive ingenuity can make equivalent to no joint; and however well this class of devices may work on street lines, there is a rooted prejudice against them for steam cars, and a distrust of any claims put forth in their behalf as being applicable to such cars. No running tests, however favorable, can eradicate from the minds of railroad mechanics and managers the idea of rattle-trap piece-work. They know that upon all the great lines of steam roads where 20° curves are the minimum, the cost of repairs or the damage caused by accidents that loose wheels might have prevented, does not amount to a very large percentage of the aggregate of such cost and damage, and they are consequently slow to favor any plan that proposes to substitute complexity for simplicity, piece-work for solidity, lest the advantages gained might not be a sufficient compensation for what would be lost. The curves of the New York Elevated Railway tracks are some of them only 90 feet radius; and yet the independent wheels that were tried on some of the cars when the lines were first opened have all given place to rigid ones. The very idea of wheels fast to the axles, and the axles held by the truck frames rigidly parallel to each other, traversing curves like these even at slow speed is apt to impress most people with a certain sense of insecurity and unfitness.

For these reasons it may, we think, be considered settled that upon steam lines any construction of running gear in which one wheel can move independently of the other on the same axle is inadmissible, and that drawbacks and disadvantages inseparable from rigid wheels will be reduced to a minimum in the future by the gradual straightening of curves so far as the financial condition of railroad companies will warrant an expenditure for that purpose.

OUR TIMBER RESOURCES.

To take an account of stock of the standing timber in the United States and Canada fit for the saw-mill, and arrive at a result that will not be more than a few thousand millions of feet out of the way is, to say the least, a pretty formidable undertaking, even for experts in that line of investigation. And yet, if we may judge from the earnest discussions of the timber supply problem in the newspapers and class journals, the inventory has already been taken, and the prospective rate of consumption estimated with such accuracy that a general, wide-spread and irremediable timber famine appears to be so imminent that in ten years from now there will be, it is said, a sudden and forced substitution of brick, stone and iron for building purposes in lieu of wood; and in seven years we shall also see the last of white pine in our forests. This would be a dismal outlook, indeed, were it not for one consoling fact. The experts are widely at variance in their figures and conclusions, a circumstance which seems to indicate that their sources of information are not of the most reliable character. The *Northwestern Lumberman*, which is, or ought to be, a pretty good authority on the lumber question, pours ridicule on the famine croakers by showing that their figures are not only wide of the mark, but inconsistent and contradictory, regards the prediction that white-pine will disappear from our forests in seven years as preposterous, and denies that there is the slightest danger that our timber resources are on the verge of exhaustion, if they are economically used and wasteful destruction avoided.

The note of alarm has been so long and so persistently sounded that people are getting used to it. They are beginning to discover that the continent can not be stripped of its forests by doleful outcries and a parade of figures unsupported by facts. The truth is that the timber resources as yet untouched, and to a great extent inaccessible, in the Southern and Southwestern States, on the Pacific coast and in Canada, are immense; and, allowing for an increased rate of consumption, it will be a long time before the stage of actual famine will be reached. It is estimated that our railroad mileage will ultimately reach 300,000 miles of track. In such case, where are the ties to come from for the enormous new construction, to say nothing of periodical renewals, if the impending timber famine is so close upon us that in ten years the only available material for building purposes will be brick, stone and iron? And how about the coal for running 60,000 locomotives and an incomputable number of new machine-shops, furnaces and factories? We can not, it is true, take an inventory of our coal deposits to get up a scare about fuel, but such a thing would be about as rational as some of the wild speculations in respect to timber. There is considerable of a margin for the latter left yet, and until it is very much less than its present dimensions the lumber market is not likely to be cornered for some little time yet.

MAKING BRAKE CONNECTIONS INTERCHANGEABLE.

The lamented death of Howard Fry deprived the last Master Car-Builders Convention of a report on a subject which we think deserves more attention than it has received. We refer to "Brake shoes, brake beams, and the interchangeable parts of the brake arrangement of cars." This subject was under investigation by a committee, of which Mr. Fry was chairman. Had he lived, there is no doubt but the report would have exhibited the matter in its full importance. There has been so much attention directed to discussing the pros and cons of a standard car, where every part would be made of a recognized size, that attempts to agree upon minor points have been neglected. Yet while the standard car remains an open question, agreement might sometimes be reached about interchangeability of minor parts, which would prove of immense service in the operating of railroads. The adoption of the Master Car-Builders' standard axle has been a great benefit to railroad companies, effecting important savings in time and money. The agreement respecting the dimensions of that axle came round in the way of compromise between conflicting wants and opinions, but the axle has been nevertheless a decided success, although a better axle might possibly have been decided on had the members kept discussing the subject for ten or fifteen years longer. But in that case the railroads would have lost the services and conveniences of an interchangeable axle for twenty years. All the reasons that can be brought to bear in favor of the adoption of the standard axle may cogently be urged in favor of brake connections being made interchangeable with the least possible delay.

No portion of a car is so much liable to minor damage as the brake connections. Shortly after leaving its own road on a long journey, a car has a brake rod which breaks or a brake head that gets lost. If these articles were interchangeable, the first car inspector who examined the car would have the brake put in order. But as foreign roads, under the existing want of system, do not generally have the material on hand for effecting minor repairs of that kind, they let the car go on without a brake. The consequence is that, at every yard where trains are broken up, this car is banged round for want of a brake, and it is fortunate if it gets home without sustaining serious damage. And when one piece of a brake connection gets broken or lost, it is surprising how soon the other portions find their way into the ditch. When damage even of a minor character happens to a brake while on a foreign road, it may confidently be predicted that the car will need an entire new brake when it reaches the home shops.

In arranging interchangeable connections and attachments of freight car brakes, master car-builders should be guided by the probability that within a very few years the urgent need for a continuous freight-brake will result in the general adoption of some brake of this kind. Connections that work indifferently well with a hand-brake, would be inadmissable in the case of a continuous brake. It has been repeatedly pointed out that the brake connections on many railroads are dangerously weak, a fault which would instantly become more apparent and hazardous were they attached to a power cylinder or any other appliance where a force would be impressed upon them at every stopping point or descending grade. The continued demand for more rapid transit of freight can only be met by accelerating the speed of freight trains. Locomotives are ready to attain the required speed, and the road-bed and bridges are in proper order to stand the increased impact; but the absence of proper brakes to control the trains stands as an obstacle in the way of a very desirable reform. It is a very expensive obstacle, and cannot be permitted to bar the way of progress many years longer.

REGULATING RAILROADS IN GEORGIA.

There is one thing which the type of rustic law-makers who figure in some of our local legislatures can only learn by dear bought experience, and that is that their certificates of election do not endow them with any newly acquired capacity for handling intricate economic problems, and questions affecting the commercial and industrial interests of great communities. In matters of a vital nature, which are always more or less complicated, this experience involves a great deal of empirical blundering which is vastly more deterimental to the public than to the blunderers individually. If there is any thing which this class of legislators fancy they know more about than any body else, it is railroading in all its details. They can run a country store, a saw-mill or a farm very successfully, and the railroad system, they imagine, can be managed in the same way. It must be reduced to a few simple principles, such as are recognized in ordinary mercantile traffic and dealing, and then by embodying the practical details in a statute, with a rigid scale of rates and fares and distances, the whole thing is put on a permanent basis for all time, and the great system can go on expanding indefinitely within the limits prescribed. This plan has been tried again and again, and has in every instance been attended with signal failure. The would-be law-makers stand aghast at the result, and, unlike Keely, retire discomfited from the field, with a growing suspicion that they have undertaken a job of larger dimensions than they had supposed.

Something like this has occurred, or rather is occurring, in the State of Georgia, in spite of the broad light which has been shed upon the nature and science of railroad transportation within the past few years by those who, from life-long experience, have acquired a thorough practical knowledge of the subject. The railroad commissioners of the State appear to be eager to travel in the footsteps of their illustrious predecessors elsewhere, by regulating passenger and freight traffic in the most arbitrary manner. A bill is also pending in the legislature giving each county the power to assess railroad property within its limits for taxation. The bill also provides that when a railroad has used a station for a period of five years, such station must thereafter be maintained permanently, no matter what the cost may be to the road. This kind of thing if persisted in will make a record which the people of that enterprising and thriving State will not point to with pride a few years hence.

ABOUT CORNERS.

Corners are, as a rule, ugly things, whether they occur in stock or produce transactions or in mechanical construction, and the sharper they are in every case the more irritation and discomfort they are apt to occasion. The corners in speculation make some people poor while others are enriched, but the corners and sharp angles in cabinet work and in the inside finish of passenger cars annoy a great many people and give pleasure to nobody. This is a matter which has of late received more attention from car-builders than formerly, but it is no uncommon thing now to find the edges of moldings about the windows, the arms of seats, the corners and ornamental projections of parcel-racks, etc., sharpened to such an edge as to be unpleasantly suggestive of consequences in case of violent involuntary contact with them—a thing which sometimes happens to people when riding in cars. The contour of the human body is not angular, the bones even are rounded off and quite free from sharp edges and straight lines, and as the inside of a passenger car is a receptacle for a large number of such bodies, straight lines in the finishing should be avoided as far as possible and sharp angles should be avoided altogether. What is more aggravating to a tired and sleepy traveler, or for that matter, to an untired and wakeful one, than the rigid straightness of a seat-arm, or the angular projections on the car side or about the windows that can not be touched without invoking upon such contrivances an inverted blessing. There is one nook of comfort—four of them in fact—in the old style Broadway omnibus, and that is the corner seat with its nicely fitting curves producing a delightful sense of adaptation. It is not so, as every one knows, with a corner seat in a street car, which is a corner in fact as well as in name; the lines are straight instead of curved, and a round man or a round anything else will not fit into it.

Aside from the mere promotion of physical comfort, there is another important reason for rounding off things. It is more artistic and harmonizes with our innate perceptions of beauty. In building machinery, the best designers now round off all the corners where it is practicable, not so much to keep people from being bruised by contact with them, but it is more tasteful, and more in conformity with the universal fitness of things.

JUMPING ON AND OFF RAILWAY TRAINS.

In England, a person who attempts to get on a railway train when it is moving, or who jumps off before the train stops, is liable to be taken before a magistrate and fined, and we believe that similar regulations are in force on continental roads. On our American roads, however, there is no restraint upon such temerity. Everybody here has the inalienable right of risking his own neck or limbs at pleasure; and more than that, he exults in its possession. He may scramble on or leap from a train moving at twenty miles an hour, and that is nobody's business but his own, unless he happens to be harmed by the rash attempt, in which event his first impulse is to consult a lawyer to see whether the railway company can not be made to pay damages. But that he has not a perfect right to take the hazard of being chopped to mince-meat under the wheels of the flying train, is a thought that never enters his head. Without discussing the point as to whether a man has a right to take his own life or cripple himself, it may be said that the English system of punishing the rashness of such people has a good effect. It makes them pause before attempting to execute the feat, because it is not merely that a fine and payment of costs await him, but that he is subject to detention, and perhaps, a lock-up over night. This is a dear price to pay for the few seconds he might have gained by leaping from a train before it had stopped, and forcibly illustrates the venerable maxim, "more haste less speed," which the dullest of mortals can appreciate. Theoretically, the adoption of such a system of restraint on our roads might be obnoxious to our high-pressure views of personal liberty, but practically it is an excellent one. As a rule, we are not in favor of excessive precautionary measures, such as locking people in cars when traveling or fettering the free movement of a thousand sensible persons in order that one person with no sense may be kept from hurting himself. The desired end could be reached by subjecting the one foolhardy and stupid individual to a light penalty rather than give inconvenience and trouble to a vastly greater number who need no protection.

A PARCELS-POST system has just gone into operation in England, which is practically the same as our own department of postal service which provides for the transmission through the mails of articles embraced in the categories of third and fourth class matter. This kind of thing is an old story with us, and also in some European countries; but in England it is a tremendous innovation, if we may judge from the ponderous articles in the London journals on the subject of the new departure. The convenience of the system is admitted, but at the same time it is evidently looked upon as an experiment that will bear watching lest it might in some way unsettle the traditional stability of things. We venture to predict than in less than a year the most inveterate conservative in the Kingdom will become as completely reconciled to it as are the horses in our streets to the clatter of trains on the elevated railroads. By and by it to be hoped that a convenience equally important, especially to transatlantic travelers, will be inaugurated on English railways, namely, the checking of passengers' baggage. This would not interfere with the seclusion of compartment carriages, nor necessitate a bell-cord, or retiring saloons, or the passage from one car to another while the train is in the motion.

In the list of representative members of the Master Car-Builders' Association printed in the July CAR-BUILDER, the number of cars represented by Mr. W. F. Turreff, the General Master Mechanic of the Cleveland, Columbus, Cincinnati & Indianapolis Railway, was stated to be 2,000. This is an error. The number of cars controlled by that road is 6,515, and by the Indianapolis & St. Louis road 2,948. We have never seen any authentic statement of the cars represented at the June meeting of the Association, but copied the figures which appeared at the time in the Chicago papers, supposing them to be correct.

THE collapse of the telegraphers' strike furnishes food for reflection, and it will be well if the individual strikers do a little reflecting on their own account in future, instead of delegating that important duty to Brotherhood managers. The flow of a stream can not be stopped by fiat. It can only be stopped by controlling the thousand little rivulets that feed it, and this the strikers and their managers were unable to do.

CREDULITY.

"Suppose," said the fireman, rubbing the grime
From off his dark complexion,
"Suppose you were trying to make up time,
And not a tank on the section!
And suppose that the water was down to 'three,'
With the gauge somewhat up in high G,
What's done in a case like that?"

"Done!" smiled the lofty engineer,
"I'd just haul open the throttle!
I've run a train on a bottle of beer,
And then thrown in the bottle!
There's engineers on passenger trains
That's made times on a flask.
It's only a matter of pluck and brains;
But tell me, why do you ask?"

"Because," said the fireman, rubbing his nose,
And giving the shovel a yank,
"I think by the way she snorts and blows
There's not a drop in the tank!
And now I would really like to see
A beer bottle start her pump;
Here's one that the section boss gave me—
Now work it or else you jump!"

One bound, and the lofty engineer
Went out of that engine van,
And when he struck it didn't appear
Which was the chief end of man.
"I hope," the grimy fireman said,
As he opened the throttle wide,
"I hope he isn't really dead,
But I'm engineer if he died!"

—*Drake's Magazine.*

The *American Railroad Journal*, like pure gold, emerges from the ordeal of fire brighter than ever. It has a handsome new cover, is beautifully printed and thoroughly readable throughout. Although it was born half a century ago, it exhibits no lack of vitality and vigor.

THE *American Journal of Railway Appliances* is the name of a new semi-monthly paper just started in New York. It is handsomely printed, and contains a variety of matter pertaining to the specialties indicated by its name; also current items of railway news, and a fair sprinkling of illustrations.

THE *Railway News* is another recent venture of the "monthly" sort, which has just made its appearance in Philadelphia. The amazing increase of railroads and railroad traffic seems to imply that there is room for these new-comers, but in view of the short-lived existence of many similar undertakings, the question will for some little time remain an open one.

INTERLOCKING OF SWITCHES AND SIGNALS.—We have received from the Union Switch and Signal Company, of Pittsburg, Pa., three admirably arranged catalogues with numerous illustrations, which, with the descriptive matter, show in the clearest manner the construction and working of their apparatus for the interlocking of switches and signals under various conditions to which it is applicable; and it may be said that in its present development it practically meets every requirement of safety that may be found to exist at the most complicated junctions and track yards, as well as at bridges and crossings. The Interlocking Catalogue contains 89 pages, in which are explained the Saxby & Farmer, the Hydraulic, and the Electro-Pneumatic Apparatus; also the union of the Interlocking and Electrical Block Systems, the Sykes' System of Lock and Block Signaling, and the methods and mechanical appliances employed in the operation of each. The Catalogue of Automatic Electric, Rail Circuit Block Signaling, and Catalogue of Frogs and Switches, are of uniform size of pages with the first named catalogue, and the illustrations and letter-press are in the same style, the three together covering the whole ground and embracing the entire system of interlocking apparatus as now applied by this company. The illustrations are so complete in every detail, and the accompanying descriptive matter so clear and concise, that however confused and complicated the system may appear to a casual observer, it can be very fully understood by any one who will give it the requisite attention. Judging by the list given in the catalogues of railroads using the interlocking apparatus and the electric block signal system of the company, the adoption of these appliances is being rapidly extended and recognized as indispensable for the safe operation of railroads.

WORTHINGTON STEAM PUMPS AND PUMPING ENGINES.—Henry R. Worthington, of 86 and 88 Liberty street and 145 Broadway, New York, has issued an illustrated catalogue and circular of steam pumps and hydraulic machinery, containing engravings of pumps designed for the different kinds of service; instructions to enable purchasers to make a proper selection, a table for comparing the capacity of the Worthington pump with that of any single-cylinder steam pump, and a variety of information needful to the buyers and users of these machines. The circular also contains illustrations of the Worthington water meters, with detailed description of their construction, sizes, capacity and mode of using.

AJAX METAL.—This composition, the base of which is Lake Superior copper, is intended as a substitute for brass and other metals now used for bearing purposes in machinery. The amalgum is of such a nature as to be remarkably homogeneous and of a peculiarly oily character, while the fiber of the metal is so tough as to have a tensile strength almost equal to that of steel. Its wearing qualities have been fully tested both in England and in this country, and from the very flattering testimonials that have been shown to us, it seems to be admirably adapted to marine and stationary engines, and to all kinds of machinery where durable and economical bearings are required. As a test of its superiority, the manufacturers offer to furnish a set of bearings to any railroad in the United States on condition that they be used side by side with any other bearing, so as to show comparative results in mileage, the company being willing to guarantee a saving of from 25 to 50 per cent. in the cost. The metal is of three qualities, numbered 1, 2 and 3, and designed for different classes of work, as specified in the company's circulars. The Ajax White Metal can be used in a composition, as tin is with copper, giving, it is claimed, 50 per cent. greater mileage, less friction and journal wear, at a cost not exceeding that of copper, tin or gun metal. Full information may be obtained by addressing The Ajax Metal Co., Philadelphia, Pa.

LOWE'S METALLIC PAINT.—The fire-resisting qualities of this paint were recently tested in Minneapolis, Minn., where a large wooden building that had been painted with it was saved, although a large warehouse alongside, filled to the peak with empty barrels, was burned to the ground. The paint is now made in a ready-mixed form instead of being confined exclusively to the dry oxide, and is finding such favor with the public and the trade, that the company is erecting a large building for grinding, mixing and putting it up in cans and barrels. It is claimed that the paint is, in fire-proof qualities, next to iron roofs. On shingle roofs it is invaluable, causing the shingles to last many years longer, and on iron and tin roofs it is indispensable. Manufactured by the Lowe's Metallic Paint Co., Chattanooga, Tenn.

TIN PLATES.—The N. & G. Taylor Co., of Philadelphia, Pa., have just issued a new and elaborately illustrated catalogue and price list for the use of the trade, embracing their leading specialties and a large variety of miscellaneous goods included in their line. The catalogue makes a volume of 272 pages, the contents of which are admirably arranged for easy reference by means of a comprehensive index. The company has been established since 1810, is thoroughly familiar with the wants of the trade, and possesses unsurpassed facilities for the prompt and satisfactory filling of orders. The limits of a brief notice do not admit of a reference to particulars, which include in a general way roofing plate, black and galvanized sheet iron, ingot copper, wire, zinc, lead, stamped ware, tools and machines, with special reference to the Taylor "Old Style" double-coated charcoal roofing plate, the demand for which is enormous; the "Hendy" extra fine warranted plate, indispensable in first-class tin work; extra large sheets of tin plate for dairy and mill work; unadulterated solder of all grades made in the establishment by experienced hands; and a full line of tinners' trimmings of every description. Parties who buy these goods get precisely what they pay for, and the same may be said with respect to all articles contained in the catalogue. The company have introduced important improvements in tin plate, and are constantly making additions to their extensive stock.

Our Directory.

We note the following changes since our last issue:

Alleghany Central.—This road has been consolidated with the Lackawanna & Pittsburg, and the two roads will be known as the Lackawanna & Pittsburg Railroad Co.

Atchison, Topeka & Santa Fe.—George Hargraves has been appointed Purchasing Agent vice Frank M. Smith, resigned.

Bradford, Bordell & Kinzua; Bradford, Eldred & Cuba; and Tonawanda.—B. C. Williams has been appointed General Manager of these roads in place of R. G. Taylor, who is now President.

Central of Georgia.—T. D. Kline has been appointed Superintendent of the Southwestern R. R. in place of W. F. Shellman, who has been appointed Traffic Manager.

Central Pacific.—C. B. Seymour has been appointed Superintendent of the Colorado Division, with office at the Needles, Cal. This is the new division, built to connect with the Atlantic & Pacific.

Chicago, St. Paul, Minneapolis & Omaha.—Jas. McCabe is appointed Superintendent of the Nebraska Division in place of George V. Morford, resigned.

Lehigh Valley.—W. C. Alderson is Purchasing Agent vice L. Chamberlain, deceased.

New York, Ontario & Western.—Charles Paine has been appointed General Manager, and R. H. Soule Superintendent of Motive Power. These officers hold the same positions on the New York, West Shore & Buffalo.

Oregon Ry. & Navigation Co.—Robert E. O'Brien has resigned the position of Assistant Manager.

Pennsylvania.—Robert L. Holliday has been appointed Superintendent of the Bedford Division in place of Thomas A. Roberts, who has been appointed Superintendent of the Middle Division of the Phila. & Erie Division.

Rome, Watertown & Ogdensburg.—The new Gen. Manager, H. M. Britton, has appointed J. D. Remington Ass't Supt. of the Eastern Division, and W. H. Chauncey Ass't Supt. of the Western Division.

Texas & St. Louis.—A. L. Horner has been appointed Superintendent, and takes the position formerly occupied by J. B. Van Dyne, General Superintendent.

Employment.

Advertisements will be inserted under this heading for one dollar for each insertion.

WANTED.—A man of large experience in freight car building wishes to take charge of the wood department in a car works, or to obtain a position as inspector of cars on a railway. Can furnish the best of references. Address H. A. D., Post Office box 13, Carrollton, Carroll Co., Kentucky.

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AND MANUFACTURERS OF

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PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS PACIFIC RAILROAD CO.,
CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent Chicago, Ill.
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
GILBERT & BUSH CO., Troy, N. Y.
WASON MANUFACTURING CO., Brightwood, Mass.
BILLMEYER & SMALL, MANUFACTURING CO., York, Pa. } Railroad Car Builders.
JACKSON & SHARP CO., Wilmington, Del.
BARNEY & SMITH MANUFACTURING CO., Dayton, O.

The advantages derived from the use of such Special Colors are many, a few of which are found below: **ABSOLUTE UNIFORMITY OF SHADE. DURABILITY,** as we use perfectly pure materials. **SAVING OF MONEY,** because of small quantity required. **SAVING OF TIME,** in the putting on of the same. **SAVING OF LABOR AND MATERIAL,** as no extra amount of Varnish will be required to hide a sanded surface **LARGER DEGREE OF CERTAINTY** that there will be an absence of cracked work, as our mixtures are all uniform, being done by weight only.

We make any desired shade, it only being necessary that purchasers furnish us with sample of color desired, stating the time they would like to have the paint dry in.

We shall be glad to furnish samples and give prices to any who may wish to avail themselves of the above advantages.

Very respectfully

JOHN W. MASURY & SON, New York and Chicago.

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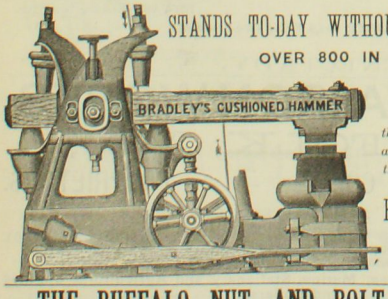
BRADLEY'S CUSHIONED HAMMER

STANDS TO-DAY WITHOUT AN EQUAL.

OVER 800 IN USE.



It approaches nearer the action of the Smith's arm than any hammer in the world.

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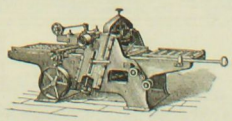

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OFFICE, NO. 14 NORTH FIFTH STREET,

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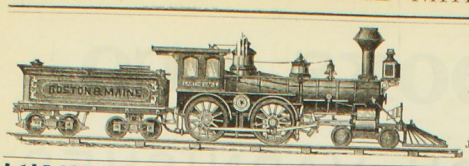

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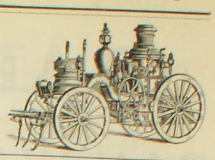

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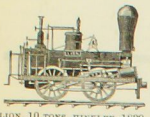

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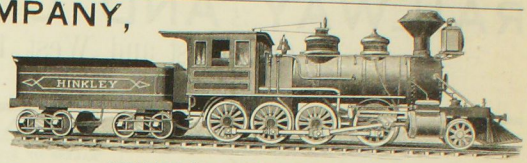

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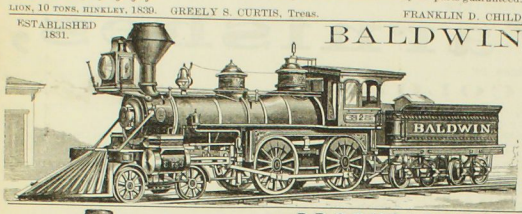

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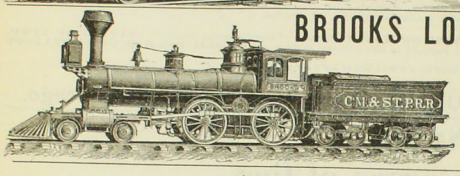

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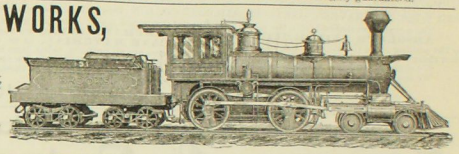

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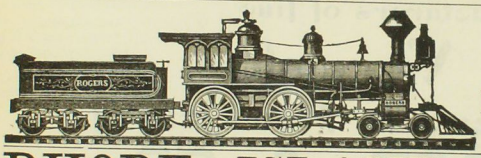

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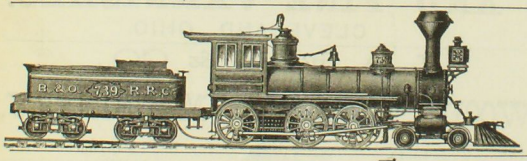

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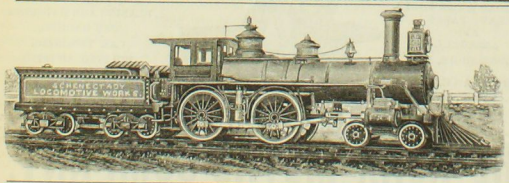

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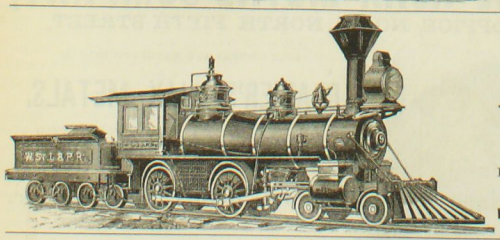

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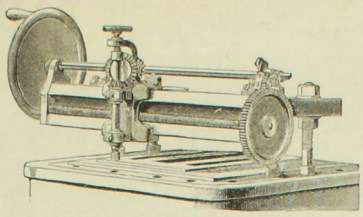

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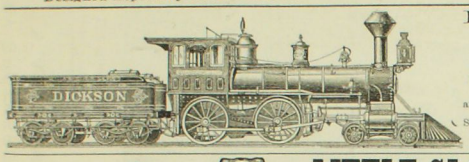

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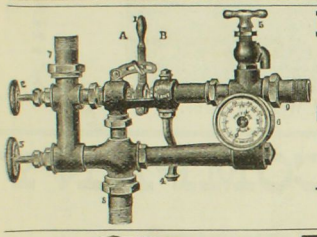

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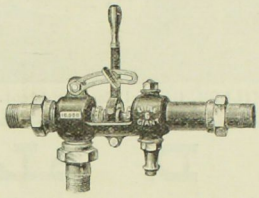

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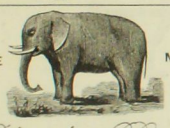

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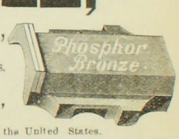

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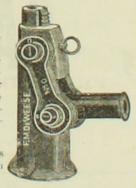

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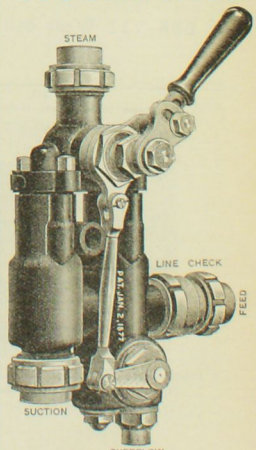

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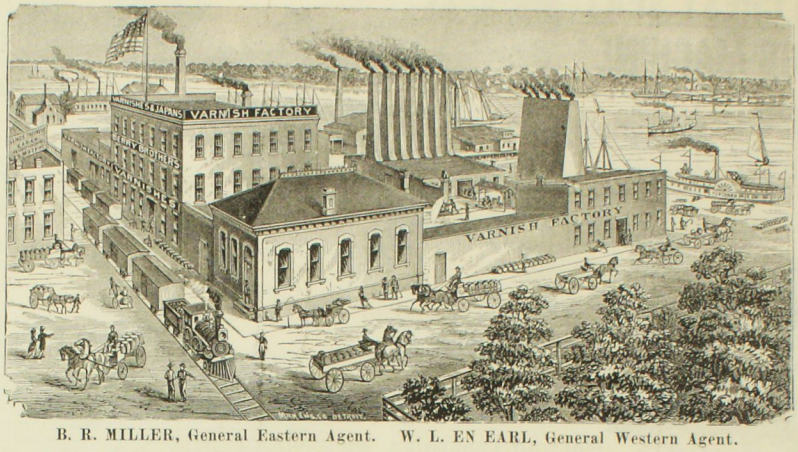

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Capacity, 35000 Pounds Each.
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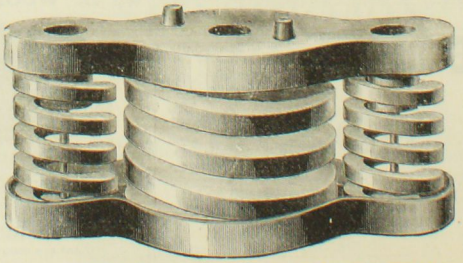

Capacity 40000 Pounds Each—Motion Softer than Ellipties.
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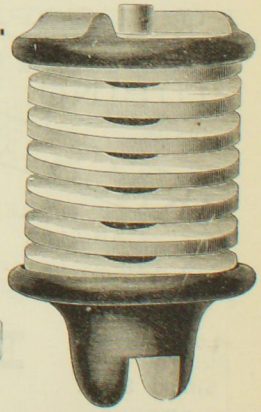
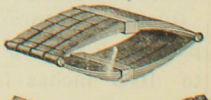


Patented January 3d, 1882.



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Jas. McKay, *M. M. & C. B*.....Hillsboro, N. B.
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David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.).....Pittsburg, Pa.
A. A. Jackson, *Supt.* (L.G. Div.).....Reynoldsville, Pa.
Geo. W. Glass, *M. M*.....Verona, Pa.
R. Gunning, *M. C. B*.....Verona, Pa.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt*.....Annapolis, Md.
John L. Beall, *M. Mach*.....Annapolis, Md.
Arkansas Midland R. R. 3-0 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man*.....Helena, Ark.
H. B. Johnson, *M. M. & M. C. B*.....Helena, Ark.
Atchison Coal & Iron Ry. 4-8½ g. 30 m. 7 lo. 425 c.
Douglas Putnam, Jr., *Gen. Supt*.....Ashland, Ky.
Robt. Peebles, *Pur. Agt*.....Ashland, Ky.
E. M. Roberts, *M. M*.....Ashland, Ky.
Ashtabula & Pittsburgh Ry. *(See Penna. Co.)*
Asheville & Spartanburg R. R. 5 g. 48 m. 3 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt*. Spart'b'g, S. C.
Wm. Platt, *M. M*.....Spartanburg, S. C.
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4-8½ g. 1,900 m. 347 lo. 9,607 cars.
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D. B. Sibley, *Pur. Agt*.....Chicago, Ill.
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4-8½ g. 1,539 m. 546 lo. 14,882 cars.
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J. A. Hardenburg, *Pur. Agt*..21 Cort. st., N. Y.
Wm. Johnson, *M. M*.....Towanda, Pa.
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3 g. 41 m. 5 lo. 65 cars.
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Capt. Geo. Elliott, *M. M*.....Bedford, Ind.
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Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 3 lo. 25 c.
S. J. Cochran, *Mast. Trans*.....Bellaire, O.
Bell's Gap R. R. 3 g. 23 m. 4 lo. 130 cars.
R. S. Ford, *Supt*.....Bellwood (P. O.), Pa.
A. Zimmerman, *M. C. B*.....Bellwood, Pa.
Bennington & Rutland Ry. 4-8½ g. 9 m. 3 lo. 214 c.
F. C. White, *Supt. & Pur. Agt*. Bennington, Vt.
G. W. Blanchard, *M. M*.....Rutland, Vt.
Bingham, Canyon & Camp Floyd, and
Wasatch & Jordan Valley R. R's.
3 g. 44 m. 7 lo. 300 cars.
J. G. Kennedy, *Gen. Man*. Salt Lake City, Utah
Geo. M. Young, *Supt*.....do. do.
Bodie Lumber Co.....3 g. 34 miles
Thomas Holt, *Supt. & Pur. Agt*.....Bodie, Cal.
E. M. Luckett, *M. M. & C. B*.....Bodie. Cal.
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. M. Witter, *Gen. Man*.....Worcester, Mass.
Chas. F. Brigham, *M. M*.....Worcester, Mass.
Boston Concord, Montreal & White Mts. R. R.
4-8½ g. 167 m. 34 lo. 977 cars.
W. A. Stowell, *Supt*.....Lake Village, N. H.
Geo. W. Storer, *Pur. Agt*.....Boston, Mass.
R. Adams, *M. M*.....Lake Village, N. H.
G. A. Ferguson, *Asst. M. M*..Lake Village, N. H.
L. D. Pickering, *M. C. B*.....Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 65 m. 18 lo. 1,038 cary.
H. L. Morrill, *Gen. Man*.....Saratoga, N. Y.
C. H. Cady, *Supt*.....Mechanicville, N. Y.
J. H. Wilder, *Pur. Agt*.....Mechanicville, N. Y.
H. L. Corey, *M. M*.....Mechanicville, N. Y.
John S. Ellis, *M. C. B*.....Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 4-8½ g. 9 m. 5 lo. 46 c.
Eugene M. of Trans.....Boston, Mass.
C. A. Hammond, *Supt. & P. Agt*. Boston, Mass.
J. L. Folsom, *M. M*.....Boston, Mass.
Geo. Coghlan, *M. C. B*.....Boston, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt*.....Boston, Mass.
E. Gallup, *Asst. Supt*.....Springfield, Mass.
A. B. Underhill, *Supt. M. P*..Springfield, Mass.
F. D. Adams, *Gen. M. C. B*.....Allston, Mass.
H. B. Chesley, *Div. Supt*.....Boston, Mass.
G. H. Colby, *Div. M. M*.....Boston, Mass.
C. E. Grover, *Div. Supt*.....Springfield, Mass.
H. W. Eddy, *Div. M. M*.....Springfield, Mass.
J. B. Weston, *Fur. Car Sh*. Springfield, Mass.
W. H. Russell, Jr., *Div. Supt*.E. Albany, N. Y.
T. B. Purvis, *Div. M. M*..East Albany, N. Y.
J. E. Doran, *For. Car Sh*..East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 73 lo. 1,231 cars.
C. H. Mellen, *Supt*.....Boston, Mass.
F. H. Nourse, *Pur. Agt*.....Boston, Mass.
J. F. Crockett, *Supt. T. & Mach*..Boston, Mass.
Boston & Maine R. R. 4-8½ g. 906 m. 80 lo. 2,100 c.
J. T. Furber, *Gen. Supt. & P. A*..Boston, Mass.
Geo. J. Fisher, *Pur. Agt*.....Boston, Mass.
Wm. Smith, *M. M*.....Boston, Mass.
D. C. Richardson, *M. C. B*.....Lawrence, Mass.
Boston & Providence R.R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt*.....Boston, Mass.
Geo. Richards, *M. M*.....Roxbury, Mass.
Jno. Lighner, *M. C. B*.....Roxbury, Mass.
Bradford, Bordell & Kinzua R. R. 3 g. 30 m. 2 lo. 80 c.
B. C. Williams, *Gen. Man. & P. A*..Bradford, Pa.
John Delaney, *M. M. & C. B*.....Bradford, Pa.
Bradford, Eldred & Cuba R.R. 3 g. 54 m. 2 lo. 132 c.
B. C. Williams, *Gen. Man. & P. A*..Bradford, Pa.
Jno. Delaney, *M. M. & C. B*.....Bradford, Pa.
Breakwater & Frankford R. R. *(See Junc. & Break.)*
Brighthope Ry. 3 g. 37 m. 3 lo. 193 cars.
Jas. D. Worth, *Supt*.....Richmond, Va.
A. Gary, *Supt. Way & Works*..Winterpock, Va.
Alex. Calder, *M. M*.....Chester, Va.
Brunswick & Albany R. R. 5 g. 172 m. 11 lo. 300 c.
H. S. Morse, *Gen. Man*.....Brunswick, Ga.
R. D. Meader, *Supt*.....Brunswick, Ga.
Buff. N. Y. & Erie Ry. 3 & 4-8½ g. 242 m. 48 lo. 3,500 c.
Oliver Watson, *Gen. Man*.....Buffalo, N. Y.
Geo. S. Gatchell, *Gen. Supt*.....Buffalo, N. Y.
W. W. Wheeler, *Asst. to G. Supt*..Buffalo, N. Y.
J. H. Poole, *Pur. Agt*.....Buffalo, N. Y.
Allen Veal, *Supt. M. P. & M*.....Buffalo, N. Y.
Buff. Pitts. & Pittsburgh R. R.
Robt. Williams, *Supt*.....Cedar Rapids, Ia.
T. Stickney, *Pur. Agt*.....Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B*..Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt*.Burlington, Vt.
F. A. Brownell, *M. M., M. C. B. & A*. do.
Burlington & Mo. Riv. R. R. (in Neb.) *(See C., B & Q.)*
Burlington & North West'n Ry. 3 g. 38 m. 3 lo. 85 c.
Wm. T. Perry, *Supt*.....Burlington, Ia.
Burlington & Ohio River R. R.
Gen. Man. & Pur. Agt.Chicago, Ill.
J. K. Lape, *Supt. of Equip*.....Chicago, Ill.

C

California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Rice, *Supt*.....National City, Cal.
Berkley Powell, *Mech. Supt*..National City, Cal.
Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 294 c
W. N. Bispham, *Supt*.....Camden, N. J.
Rufus Hill, *M. M*.....Camden, N. J.
Samuel Wills, *M. C. B*.....Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 80 lo. 3,367 c.
W. P. Taylor, *Gen. Man*.....Buffalo, N. Y.
A. F. Howland, *Pur. Agt*.....St. Thomas, Ont.
Robt Potts, *Gen. M. C. B*.....St. Thomas, Ont.
Can. Div.: E. P. Murray, *Supt*..St. Thomas, Ont.
Robert Potts, *M. C. B*.....St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt*.....Detroit, Mich.
O. P. Dunbar, *M. M*.....Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
W. Van Horne, *Gen. Man*..Winnipeg, Man.
Eastern Div.....240 m. 16 lo. 276 cars.
Archer Baker, *Gen. Supt*.....Montreal, Can.
Tho. Irwin, *Mech. Supt*.....Brockville, Ont.
Western Div.....311 m. 10 lo. 207 cars.
J. M. Egan, *Gen. Supt*.....Winnipeg, Man.
W. Shaughnessy, *Pur. Agt*.Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B*.Winnipeg, Man.
Cape Fr'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
W. Shaughnessy, *Supt*.....Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B*..Fayetteville, N. C.
Carolina Central R. R. *(See Rat. & Aug.)*
Carson & Colorado R. R. *(See Virginia & Truckee.)*
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt. & P. A*.Catasauqua, Pa.
J. Thomas, *M. M. & M. C. B*.....Catasauqua, Pa.
Chas. J. Hobbach, *M. C. B*.....Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
3 g. 170 m. 127 lo. 1,858 cars.
W. G. Raoul, *Pres*.....Savannah, Ga.
Wm. Rogers, *Gen. Supt*.....Savannah, Ga.
C. H. Carson, *Pur. Agt*.....Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M*.....Savannah, Ga.
John McCann, *M. M*.....Augusta, Ga.
F. Devine, *Pur. C. Sh*.....Savannah, Ga.
So.-West'n Div.: T. D. Kline, *Supt*.....Macon, Ga.
D. M. Gugel, *M. M*.....Macon, Ga.
James A. Knight, *M. C. B*.....Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c.
W. S. Strahan, *Gen. Supt*.....Elizabeth, N. J.
B. W. Burnett, *Pur. Agt*.....New York, N. Y.
Cen. Div.: W. Woodcock, *M. M*.Elizabethport, N. J.
Geo. Hackett, *M. C. B*.....Elizabethport, N. J.
C. G. Williams, *M. M*.....Jersey City, N. J.
John Alpaugh, *M. M*.....Phillipsburg, N. J.
Long Br. Div.: H. H. Inman, *Supt*. Long Branch, N. J
N. J. So. Div.: R. Blodgett, *Supt*.....Manchester, N. J.
Wm. Montgomery, *M. M*.....Manchester, N. J.
Chas. D. Sawyer, *M. C. B*.....Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt*.....Mauch Chunk, Pa.
L. C. Bradley, *Supt. Mach*.....Mauch Chunk, Pa.
Central R. R. of S. C. *(See Wil. & Wel.)*
Central Iowa Ry. 4-8½ g. 354 m. 40 lo. 1,950 cars.
D. N. Pickering, *Gen. Supt*..Marshalltown, Ia.
John Player, *M. M*.....Marshalltown, Ia.
T. L. Seevers, *M. C. B*.....Marshalltown, Ia.
Central Pacific R. R. 4-8½ g. 3,780 m. 260 lo. 7,217 c.
A. N. Towne, *Gen. Man*.....San Francisco, Cal.
J. A. Fillmore, *Gen. Supt*.....San Francisco, Cal.
R. H. Pratt, *A. G. Supt*.....San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt*..Sacramento, Cal.
A. J. Stevens, *Gen. M. M*.....Sacramento, Cal.
W. H. Mendell, *Asst. G. M. M*..Sacramento, Cal.
Benj. Welch, *Gen. M. C. B*.....Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B*.Sacramento, Cal.
Western Div. Visalia, Tulare Divs. and Northern Div.
A. D. Wilder, *Supt*.....W. Oakland, Cal.
G. D. Welch, *M. M*. (W. Div.) W. Oakland, Cal.
W. B. Ludlow, *M. C. B*. (W. Div.).....Oakland, Cal.
S. Johnson, *M. M*. (T. Div.).....Tulare, Cal.
D. Rutherford, *M. M*. (N. Rd.)..S. Vallejo, Cal.
Sacramento, Oregon & Mex. and Cal. Pac. R. R's.
J. B. Wright, *Supt*.....Sacramento, Cal.
M. W. Cooley, *M. M*. (S. Div.)Sacramento, Cal.
Truckee Div.: J. H. Whited, *Supt*. Wadsworth, Nev.
Geo. Gregg, *M. M*.....Wadsworth, Nev.
Wm. McPherson, *M. Car Sh*..Wadsworth, Nev.
Humbolt Div.: G. W. Coddington, *Supt*. Carlin, Nev.
W. F. Smith, *M. M*.....Carlin, Nev.
J. H. Doughty, *For. Car Sh*.....Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt*.....Ogden, Utah
James Lamb, *M. M*.....Terrace, Utah.
A. Shelburne, *For. Car Sh*.....Ogden, Utah.
Los Angeles and Yuma Divs. (So. Pac.):
F. E. Hewitt, *Asst. Supt*.....Los Angeles, Cal.
James Wylie, *M. M*.....Los Angeles, Cal.
T. T. Gilleland, *For. Car Sh*. Los Angeles, Cal.
Arizona Divs. (So. Pac.):
A. M. Bean, *Asst. Supt*.....Tucson. Ariz
W. F. Smith, *M. M*.....Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Asst. Supt*.....El Paso, Texas.
H. C. Standish, *For. Sh*.....El Paso, Texas.
Colorado Div.: C. B. Seymour, *Supt*. Needles, Cal.
Central Vermont R. R. 4-8½ g. 548 m. 120 lo. 2,350 c.
J. W. Hobart, *Gen. Supt*.....St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M*. St. Albans, Vt
No. Div.: T. B. Estivos, *Supt*.....St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt*.....Rutland, Vt.
N. L. Davis, *M. M. & C. B*.....Rutland, Vt.
Brat. Div.: E. F. Brooks, *Supt*..Brattleboro, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
C. F. Spaulding, *G. Supt. & P. A*. New London, Ct.
I. W. Dow, *M. M*.....New London, Ct.
S. O. Banks, *M. C. B*.....New London. Ct.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 98 c.
H. S. Haines, *Gen. Man*.....Savannah, Ga.
C. S. Gadsden, *Gen. Supt*.....Charleston, S. C.
H. A. Ulmo, *M. M*.....Savannah, Ga.
Charlotte, Columbia & Augusta R. R. *(See Rich. & D.)*
Chateaugay R. R. 3 g. 34 m. 0 lo. 125 cars.
A. L. Inman, *Gen. Man*.....Plattsburg, N. Y.
J. M. Davis, *Supt. & M. M*.....Plattsburg, N. Y.
Chattaroi Ry. 4-8½ g. 43 miles 11 locs. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A*. Ashland, Ky.
J. R. Martin, *M. M*.....Ashland, Ky.
Joseph P. Burleigh, *M. C. B*.....Ashland, Ky.
Cheraw & Chester R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt*.....Chester, S. C.
A. M. Manning, *M. M*.....Chester, S. C.
Cheraw & Darlington R. R. *(See Wil. & Wel.)*
Cheraw & Salisbury R. R. *(See Wil. & Wel.)*
John Postel, *Manager*.....Cedartown, Ga.
C. E. Scruton, *M. M. & C. B*.....Cedartown Ga.
Chesapeake, Ohio & So.-W'n
4-8½ g. 308 m. 47 lo. 1,339 c.
D. W. C. Brown, *G. S. & Pur. Agt*. Louisville, Ky.
H. E. Huntington, *Pur. Agt*.....Louisville, Ky.
F. H. Britton, *Mast. Trans*.....Paducah, Ky.
G. A. Haggerty, *S. M. P. & M*. Elizabethtown, Ky.
Geo. Hafley, *M. M*.....Elizabethtown, Ky.
Chas. Daniels, *M. M*.....Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 133 l. 3,543 c.
C. W. Smith, *Gen. Man*.....Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man*. Richmond, Va.
A. H. Wood, *Asst. Gen. Supt*., Huntington, W. Va.
A. S. Bunnell, *Pur. Agt*.....Yorkville, S. C.
T. L. Chapman, *Supt. M. P*.....Richmond, Va.
Eastern Div.: *Supt*..Richmond, Va.
J. N. Begg, *M. C. B*.....Richmond, Va.
Hunt. Div.: W. P. Harris, *Supt*.....Hinton, W. Va.
T. L. Chapman, *Asst. Supt. M. P*., and
H. C. Bassinger, *M. C. B*.Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt*..Lexington, Ky.
Chesnire R. R. 4-8½ g. 80 m. 30 lo. 400 cars.
R. Stewart, *Gen. Man*.....Keene, N. H.
H. H. Stone, *Pur. Agt*.....Keene, N. H.
F. A. Perry, *M. M*.....Keene, N. H.
A. E. Howard, *Supt. & Cor. Sh*.....Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt*.....Yorkville, S. C.
T. P. Beard, *M. M*.....Yorkville, S. C.
Chicago, B. & Kan. City Ry. 4-8½ g. 181 m. 9 lo. 130 c.
Robt. Law, *Gen. Supt*.....Keokuk, Ia.
W. H. Bartlett, *Act. M. M*.....Burlington, Ia.
Chicago, burlington & Quincy R. R.
4-8½ g. 2,924 m. 521 lo. 18,955 cars.
T. J. Potter, *Gen. Man*.....Chicago, Ill.
(1) Ca., B. & Q., East of Mo. Riv. 1,968 miles.
H. B. Stone, *Asst. Gen. Man*.....Chicago, Ill.
Wm. Irvine, *Pur. Agt*.....Chicago, Ill.
G. W. Rhodes, *Supt. M. P*.....Aurora, Ill.
W. W. Forsyth, *Mech. Eng*.....Aurora, Ill.
Ill. Div.: J. D. Besler, *Supt*.....Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt*.....Aurora, Ill.
L. L. Johnson, *M. M*.....Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt*. Galesburg, Ill.
Robert Colville, *M. M*.....Galesburg, Ill.
St. L. Div.: S. S. Crance, *Supt*.....Beardstown, Ill.
A. Forsyth, *M. M*.....Beardstown, Ill.
Ia. & Mo. Divs.: *Supt*..Burlington, Ia.
East. Dist.: O. E. Stewart, *Supt*. Burlington, Ia.
Joel West, *M. M*.....Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt*.....Ottumwa, Ia.
West Div.: W. B. Ryder, *Supt*.....Creston, Ia.
C. W. Eckerson, *M. M*.....Creston. Ia.
(2) C., B. & Q. West of Mo. Riv. 935 miles.
G. W. Holdrege, *Gen. Supt*.....Omaha, Neb.
Jas. M. Barr. *Pur. Agt*.....Omaha, Neb.
D. Hawksworth, *Gen. M. M*..Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
D. E. Thompson, *Supt*.....Lincoln, Neb.
E. Bignal, *M. M*.....Lincoln, Neb.
R. V. Dodge, *Supt. of Mach*.....Lincoln, Neb.
A. & N. Div.: J. McConniff, *Supt*.....Lincoln. Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 1,838 m. 425 lo. 13,650 cars.
S. S. Merrill, *Gen. Man*.....Milwaukee, Wis.
J. T. Clark, *Gen. Supt*.....Milwaukee, Wis.
J. T. Foster, *Pur. Agt*.....Milwaukee, Wis.
J. M. Lowry, *Gen. M. M*.....Milwaukee, Wis.
E. Fairbairn, *M. M*.....Milwaukee, Wis.
John Hamilton, *Asst. Car Dept*..Milwaukee, Wis.
(1) H. C. Atkins, *Asst. Gen. Supt*..Milwaukee, Wis.
Chi. Div.: S. J. Collins, *Supt*.....Chicago, Ill.
La Crosse Div.: G. Collins, *Supt*. Milwaukee, Wis.
C. Bluffs Div.: A. J. Earling, *Supt*.....Marion, Ia.
P. du C. & M. Pt. Divs.:
H. B. Campbell, *Supt*.....Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt*. Minneapolis, Minn.
H. & D. Div.: M. W. Kellie, *Supt*.....do.
(2) I. & P. Div.: J. Patrick, *M. M*.....Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt*. do.
So. Minn. & River Divs.:
C. W. Case, *Supt*.....Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt*. Mason City, Ia.
S. Cy. & Da. Div.: J. Jackson, *Supt*. Sioux City, Ia.
F. H. Moulton, *M. M*.....Vanburen, Dak.
Dubuque Div.: C. W. Case, *Supt*.....Dubuque, Ia.
S. Charnley, *M. M*.....Dubuque, Ia.
(3) D. A. Olin, *Asst. Gen. Supt*.....Racine, Wis.
So.-Wn. Divs.: D. L. Bush, *Supt*.....Racine, Wis.
John Taylor, *M. M*.....Racine, Wis.
E. A. Eddy, *M. C. B*.....Racine, Wis.
Northern Div.: L. B. Rock, *Supt*..Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B*..Milwaukee, Wis.
Chicago, Peoria & So.-W'n R. R. 4-8½ g. 88 m. 8 lo. 455 c.
A. H. Crocker, *Rec*.....Joliet, Ill.
J. N. Wilson, *M. C. B*.....Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 300 lo. 7,760 cars.
R. R. Cable, *V. P. & Gen. Man*.....Chicago, Ill.
A. Kimball, *Gen. Supt*.....Chicago, Ill.
H. F. Royce, *Asst. G. Supt*.....Davenport, Ia.
F. A. Marsh, *Pur. Agt*.....Chicago, Ill.
T. B. Twombly, *Gen. M. M*.....Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B*.....Chicago, Ill.
Ill. Div.: R. P. Chamberlin, *Supt*.....Chicago, Ill.
R. Biester, *M. M*.....Chicago, Ill.
Sam'l Pullman, *M. C. B*.....Chicago, Ill.
Ia. Div.: John Green, *Supt*.....Des Moines, Ia.
J. G. Crockett, *M. M*.....Stuart, Ia.
Jas. E. Morrill, *M. M*.....Davenport, Ia.
Chas. M. Leonard, *M. C. B*.....Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt*.....Trenton, Ia.
R. O. Carscallin, *M. M*.....Trenton, Mo.
Chas. R. Beal, *M. C. B*.....Trenton, Mo.
K. & Des M. Div.: Jno. Given, *Supt*..Des Moines, Ia
S. W. Wakefield, *M. M*.....Keokuk, Ia
Henry Hammuel, *M. C. B*.....Keokuk, Ia
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man*..New Orleans, La.
L. T. Brien, *Asst. Gen. Man*..New Orleans, La.
C. M. Sheafe, *Gen. Supt*.....New Orleans, La.
H. B. Ferguson, *Pur. Agt*.....New Orleans, La.
W. H. Purdy, *Supt. Mach*..McComb City, Miss.
Geo. W. Baxter, *M. C. B*..McComb City, Miss.
So. Div.: S. B. Anderson, *Acting Supt*.....do.
W. P. McKinley, *M. M*.....McComb City, Miss.
No. Div.: J. G. Mann, *Supt*.....Jackson, Tenn.
J. M. Smith, *M. M*.....Jackson, Tenn.
J. F. White, *M. M*.....Water Valley, Miss
Chicago, St. Louis & Pittsburg.
Jas. McCrea, *Pur. Agt*.....Columbus, O.
Wm. Mullins, *Pur. Agt*.....Pittsburg, Pa.
E. B. Wall, *Supt. M. P*.....Columbus, O.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,140 m. 181 lo. 5,221 cars.
J. M. Whitman, *Gen. Supt*.....St. Paul, Minn.
W. H. S. Wright, *Pur. Agt*.....St. Paul, Minn.
Matt. Ellis, *M. M*.....St. Paul, Minn.
H. L. Preston, *M. C. B*.....Hudson, Wis.
Ea. & No. Div.: A. Hobart, *Supt. St. Paul Min. St. P.* and S. C. Div.:
H. Spencer, *Supt*.....St. James, Minn.
H. C. Anderson, *Gen. For. Sh*.....Sioux Cy, Ia.
Neb. Div.: Jas. McCabe, *Supt*.....Omaha. Neb.
Chicago, Texas & Mexican Central Ry.
4-8½ g. 52 m. 4 lo. 60 cars.
Gen. Supt.....Dallas, Tex
Chas. Howard, *Pur. Agt*.....Chicago, Ill
Chicago & Alton R. R. 4-8½ g. 840 m. 213 lo. 6,148 c.
C. H. Chappell, *Gen. Man*.....Chicago, Ill.
W. F. Merrill, *Gen. Supt*.....Chicago, Ill.
A. V. Hartwell, *Pur. Agt*.....Chicago, Ill.
Wm. Wilson, *Supt. of Mach*.. Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept*. do.
Chi. Div.: A. M. Richards, *Supt*..Bloomington, Ill.
St. Louis Div.: S. D. Reeves, *Supt*.. Koolhouse, Ill.
Wm. McPhail, *M. M*.....Slater, Mo.
Chicago & Atlantic
J. Condit Smith, *Gen. Man*.....Chicago, Ill.
J. C. Williams, *Gen. Supt*.....Chicago, Ill.
East. Div.: J. H. Tinney, *Supt*. Huntington, Ind.
West. Div.: A. H. Parsons, *Supt*.....Chicago, Ill.
R. C. Ackley, *M. M*.....Huntington, Ind.
J. L. Adams, *M. C. B*.....Huntington, Ind.
Chi. & East'n Ill. 4-8½ g. 348 m. 50 lo. 3,500 cars.
O. S. Lyford, *Gen. Supt*.....Chicago, Ill.
D. R. Patterson, *Pur. Agt*.....Chicago, Ill.
P. W. Drew, *M. M*.....Chicago, Ill.
Allen Cooke, *M. M*.....Danville, Ill.
Chicago & Grand Trunk Ry. *(See Grand Trunk.)*
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 357 cars.
T. J. Potter, *Gen. Man*.....Chicago, Ill.
W. H. Holcomb, *Gen. Supt*.....Rochelle, Ill.
H. S. Bryan, *M. M*.....Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 1,878 m. 658 lo. 18,685 cars.
Marvin Hughitt, 2d *V. Prs. & G. M*.Chicago, Ill.
J. D. Layng, *Gen. Supt*.....Chicago, Ill.
R. W. Hamer, *Pur. Agt*.....Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M*.; and
J. M. Boon, *Asst. M. P. & M*.....Chicago, Ill.
Wis. and Mil. Divs. & Shoregan & W'n Ry.:
Chas. D. Gorham, *Supt*.....Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt*.....Chicago, Ill.
Fen'r Div.: W. H. Lindop, *Supt*.....Escanaba, Mich.
Geo. H. White, *M. M*.....Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt*. Baraboo, Wis.
Win. & St. P. Div.: S. Sanborn, *Supt*. Winona, Minn
W. A. Scott, *M. M*.....Winona, Minn.
Dak. Cen. Ry.: W. F. Fitch, *Supt*.....Huron, Dak.
Ia. Div.: M. Hopkins, *Supt*.....Clinton, Ia.
Geo. W. Lowe, *M. M. & M. C. B*. Clinton, Ia.
No. Ia. Div.: H. G. Burt, *Supt*.....Eagle Grove, Ia.
Chicago & West Michigan R'y.
4-8½ g. 400 m. 43 lo. 1,345 cars.
Geo. C. Kimball, *V. P. & G. Man*. Muskegon, Mich.
Gen. Supt.....Muskegon, Mich.
Edw. Hill, *Pur. Agt*.....Muskegon, Mich.
W. F. N. Davis, *M. M*.....Muskegon, Mich.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 1 lo.

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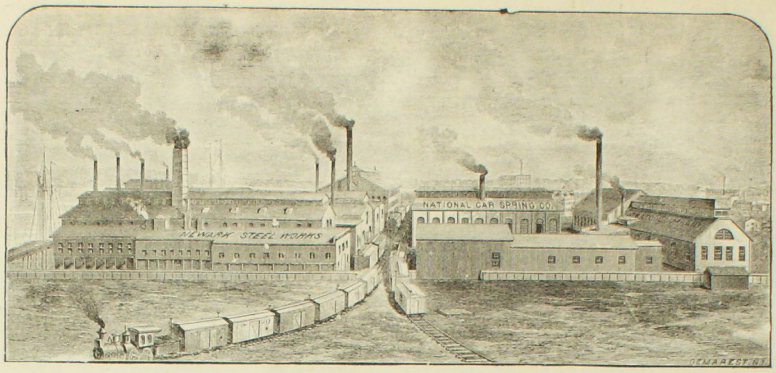

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After years of practical experience in manufacturing HOT BOX CURES AND JOURNAL LUBRICANTS, we do not hesitate to stake our reputation on the statement that

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HOT BOX CURE,

And yields a greater mileage as a JOURNAL LUBRICANT than any compound now sold.

FOR HOT BOX CURE, apply to journal under all circumstances, and in similar manner as when tallow is used—it will do a better service.

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J. A. DEAN & CO. PERFECTION PURE LINSEED OIL

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Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 33 l.o. 45.0 c.
J. Mulligan, *Supt. & Pur. Agt.* Springfield, Mass
W. H. Stearns, *M. M.* ..... Springfield, Mass
John Macnab, *Pur. Agt.* ..... Toronto, Can.
Robert Hitchcock, *M. C. B.* ..... Springfield, Mass
Connotton Valley R. R. ..... 3 g. 160 m. 26 l.o. 896 cars.
Samuel Briggs, *Gen. Man.* ..... Canton, O.
B. C. Bosworth, *M. M.* ..... Cant. n. O.
Cornwall R. R. ..... 4-8½ g. 9 m. 5 l.o. 166 cars.
Frank Donahue, *G. Supt. & M. M.* Lebanon, Pa.
Levi Bloech, *M. C. B.* ..... Lebanon, Pa.
Credit Valley Ry. ..... 4-8½ g. 184 m. 22 l.o. 535 cars.
James Ross, *Gen. supt.* ..... Toronto, Ont.
John Macnab, *Pur. Agt.* ..... Toronto, Can.
H. G. Taylor, *Mech. Supt* ..... Toronto, Can
Crown Point Iron Co. R. R. ..... 3 g. 13 m.
A. L. Inman, *Gen. Man.* ..... Plattsburg, N. Y.
J. M. Davies, *Supt. & M. M.* Crown Point, N. Y.
J. C. Sherman, *M. C. B.* ..... Crown Point, N. Y.
Cumberland Valley R. R. 4-9 g. 125 m. 21 l.o. 430 cars.
J. F. Boyd, *Supt.* ..... Chambersburg, Pa.
A. S. Holl, *M. M.* ..... Chambersburg, Pa.
C. Wicke, *M. C. B.* ..... Chambersburg, Pa.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 l.o. 635 c.
P. L. Burwell, *Gen. Supt. & P. A.* Cumberland, Md.
N. W. Howson, *Mast. of Mach.* Mt. Savage, Md.
Nathan Binix, *M. C. B.* ..... Mt. Savage, Md.

D

Danbury & Norwalk R. R. ..... 4-8½ g. 33 m. 6 l.o. 100 c
L.W. Sandiforth, *G. Supt. & P. A.* S. Norwalk, Ct.
N. M. George, *M. M. & C. B.* ..... Danbury, Conn.
Danville, Mocksville & So. Wn. R. R. ..... 96 m.
H. W. Goodrich, *Ch. Eng.* ..... Leaksesville, N. C.
Danville, Olney & O. R. R. R. 4-8½ g. 110 m. 4 l.o. 83 c
Chas. Howard, *Rec. & Man.* ..... Olney, Ill.
J. M. Graham. *Supt.* ..... Kansas, Ill.
Louis Parisoe, *M. M & C. B.* ..... Kansas, Ill.
Dayton & Union R. R. ..... 4-8½ g. 12 m. 1 l.o.
Del. Lackawanna & W. and N. Y. Lack. & W. R. Rs.
4-8½ g. 670 m. 348 l.o. 26,187 cars.
Wm. F. Halstead, *Gen. Supt.* ..... Kingslanton, Pa.
G. W. B. Cushing, *Pur. Agt.* ..... New York, N. Y
Walter Dawson, *Mast. of Mach.* ..... Scranton, Pa.
Robt. McKenna, *M. C. B.* ..... Scranton, Pa.
Bloomsb'g Div.: C. Graham, *M. M.* Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt.* ..... Utica, N. Y.
Thos. Thatcher, *M. M.* ..... Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt.* ..... Hoboken, N. J.
W. H. Lewis, *M. M.* ..... Kingsland, N. J.
J. W. Baker, *Mast. Car Rep.* ..... Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt.* ..... Oswego, N. Y.
Jas. Buchanan, *M. M.* ..... Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 l.o. 598 cars.
W. K. Niver, *Gen. Supt* ..... Syracuse, N. Y.
Jas. Buchanan, *M. M.* ..... Syracuse, N. Y.
Delaware, Maryland & Virginia R. R. ..... 4-8½ g. 101 m. 7 l.o. 145 cars.
Tho. Groom, *Supt.* ..... Lewes, Del.
Geo. Messick, *M. M.* ..... Lewes, Del.
W. H. Virden, *M. C. B.* ..... Lewes, Del.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 596 m. 151 l.o. 9,248 cars.
C. F. Young, *Gen. Man.* ..... Honesdale, Pa.
C. F. Young, *Pur. Agt.* ..... Albany, N. Y.
R. C. Blackall, *Supt. of Mach.* ..... Albany N. Y
Susq. Div.: C. D. Hammond, *Supt.* Albany, N. Y.
C. A. Jones, *M. M.* ..... Oneonta, N. Y.
J. R. Skinner, *M. C. B.* ..... Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt.* ..... Troy, N. Y.
J. L. Corey, *M. M.* ..... Green Island, N. Y.
Chr. Körner, *M. C. B.* ..... Green Island, N. Y.
Pa. Div.: R. Manville, *Supt & Pur. Agt.* and
S. H. Dotterer, *M. M.* ..... Carbondale, Pa.
T. Orchard, *M. C. B.* ..... Carbondale, Pa.
Denver & New Orleans. 4-8½ g. 140 m. 11 l.o. 400 c.
C. W. Fisher, *Gen. Man.* ..... Denver, Col.
Chas. Wheeler, *Pur. Agt* ..... Denver, Col.
S. P. Weller, *M. M. & M. C. B.* ..... Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,062 m. 370 l.o. 4,000 c
D. C. Dodge, *Gen. Man.* ..... Denver, Col.
R. B. Cable, *Gen. Supt* ..... Denver, Col.
Henry Wood, *Supt. Utah Lines* ..... S. Lake City, Ut.
A. B. Garner, *Pur. Agt.* ..... Denver, Col.
N. W. Sample, *M. M.* ..... Denver, Col.
1st Div.: W. H. Bazzette, *Supt.* ..... S. Pueblo, Col.
2d Div.: Cole Lydon. *Supt.* ..... Alamosa, Col.
3d Div.: G. W. Cook, *Supt.* ..... Leadville, Col.
4th Div.: J. Myers. *Supt.* ..... Salida, Col.
5th Div.: A. Myers.
Des Moines & Ft. Dodge. 4-8½ g. 143 m. 13 l.o. 223 c.
C. W. Filmore, *Supt.* ..... Des Moines, Ia.
John McGrayel, *M. M.* ..... Grand Junction, Ia.
E. A. Avery, *M. C. B.* ..... Grand Junction, Ia.
Det., Gr. R. & Mil. Ry. 4-8½ g. 189 m. 36 l.o. 478 c.
G. R. Nash, *Gen. Man.* ..... Detroit, Mich.
John S. Lorimer, *Storekeeper* ..... Detroit, Mich.
W. J. Morgan, *Supt.* ..... Detroit, Mich.
F. Parker, *Mech. Supt* ..... Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 l.o. 1027 c
John F. Mulliken, *Gen. Man.* ..... Detroit, Mich.
Allan Bourn, *Pur. Agt* ..... Detroit, Mich.
Thos. M. Fish, *Gen. Supt* ..... Ionia, Mich.
G. C. Mirous, *M. M. & C. B.* ..... Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 16 l.o. 1112 c.
D. McCool, *Gen. Supt & P. A.* Marquette, Mich.
John Wilson, *Mech. Supt* ..... Marquette, Mich.
Dorchester & Delaware R. R. ..... 4-8½ g. 33 m.
Thos. E. Wright, *Supt* ..... Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 l.o. 54 cars.
A. C. Goodrich, *Supt.* ..... Waverly, Ia.
W. S. Couch, *Pur. Agt.* ..... Dubuque, Ia.
Duck River Valley R. R. ..... 3 g. 34 m.
Geo. Childress, *Supt* ..... Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 l.o. 102 cars.
D. Thayer, *Gen. Supt.* ..... Dunkirk, N. Y.
R. C. Moore, *Pur. Agt.* ..... New York, N. Y.
J. C. Haggett *M. M. & C. B.* ..... Dunkirk, N. Y.

E

East Broad Top R. R. ..... 3 g. 30 m. 6 l.o. 191 cars.
A. W. Sims, *Supt* ..... Orbisonia, Pa.
A. B. Greenwood, *M. M.* ..... Orbisonia, Pa.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 133 l.o. 1,507 cars.
Henry Fink, *V. P. & Gen. Man.* Knoxville, Tenn.
J. F. O'Brien, *Gen. Supt* ..... Knoxville, Tenn.
W. A. Harrison, *Pur. Agt.* ..... Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt.* ..... Knoxville, Tenn.
B. J. Sitton, *M. M.* ..... Knoxville, Tenn.
Jos. Armbruster, *M. C. B.* ..... Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt* ..... Selma, Ala.
Simon Gay, *M. M.* ..... Selma, Ala.
W. W. Pierce, *M. C. B.* ..... Selma, Ala.
Memphis & Charleston R. R. Div.:
R. B. Pegram, *Jr. Supt.* ..... Memphis, Tenn.
H. N. Burford, *M. M.* ..... Memphis, Tenn.
Atlanta & Brunswick Divs.
Atl. Div.: Theo. D. Kline, *Supt.* ..... Atlanta, Ga.
Br. Div.: J. E. Mallory, *Supt.* ..... Macon, Ga.
M. J. Rogers, *M. M. & M. C. B.* ..... Atlanta, Ga.
M. J. Rogers, *M. M.* ..... Atlanta, Ga.
East & West R. R. of Alabama.
John Postell, *Manager* ..... Cross Plain, Ala.
Eastern R. R. ..... 4-8½ g. 283 m. 90 l.o. 2,398 cars.
Payson Tucker, *Gen. Man.* ..... Boston, Mass.
D. W. Sanborn, *Mast. of Trans.* Boston, Mass.
G. F. Bird, *Pur. Agt.* ..... Boston, Mass.
Amos Pillsbury, *S. M. P. & M.* ..... E. Boston, Mass.
Jno. Billings, *G. Pur. Car Dept.* ..... Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt.* Wolfboro J., N. H.
Eastern Kentucky R. R. ..... 4-8½ g. 34 m. 5 l.o. 123 c.
H. W. Bates, *Man. & Pur. Agt.* ..... Riverton, Ky.
D. S. Weaver, *M. M.* ..... Riverton, Ky.
Eastern Shore R. R. ..... 4-8½ g. 38 m. 2 l.o.
W. Thompson, *Supt.* ..... Princess Anne, Md.
F. Strattner, *M. M.* ..... Princess Anne, Md.
Elberton Air-Line R.R. (*See Rich. & Dan. N. G. Brs.*)
Erie & Pittsburg R. R. ..... (*See Penna. Co.*)
Eureka & Palisade R. R. ..... 3 g. 97 m. 7 l.o. 124 cars.
B. Gilman, *Gen. Supt & Pur. Agt.* Eureka, Nev.
E. C. Mills, *M. M.* ..... Palisade, Nev.
A. S. Longley, *M. C. B.* ..... Palisade, Nev.
Evansville, Paducah & Cairo Line. ..... 206 miles
G. J. Grammer, *Supt.* ..... Evansville, Ind.
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 l.o. 98 c
H. L. Shepard, *Supt.* ..... Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 145 m. 26 l.o. 900 c.
C. J. Hepburn, *Gen. Supt.* ..... Evansville, Ind.
John Torrance, *Gen. For* ..... Evansville, Ind.

F

Fitchburg R. R. ..... 4-8½ g. 189 m. 100 l.o. 3,315 cars.
John Adams, *Gen. Supt.* ..... Boston, Mass.
E. K. Turner, *Asst. Supt.* ..... Fitchburg, Mass.
E. S. Pratt, *Pur. Agt* ..... Boston, Mass.
A. Coolidge, *Supt. M. P.* ..... Boston, Mass.
W. A. Foster, *Asst. Supt. M. P.* Fitchburg, Mass.
J. W. Marden, *M. C. B.* ..... Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 345 m. 68 l.o. 1,854 cars.
H. C. Potter, *Gen. Man.* ..... E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man.* E. Saginaw, Mich.
G. G. Cook. *Pur. Agt* ..... E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt.* E. Saginaw, Mich.
W. F. Potter, *Supt.* (E. Div.) ..E. Saginaw, Mich.
M. V. Meredith, *Supt.* (W. Div.) E. Saginaw, Mich.
T. J. Hatsell, *M. M.* ..... E. Saginaw, Mich.
R. McPherson, *M. C. B.* ..... E. Saginaw, Mich.
Florida Central & Western R. R.
5 g. 234 m. 10 l.o. 160 cars.
Wm. M. Davidson, *Gen. Man.* Jacksonville, Fla.
Jas. S. McElroy, *Supt.* ..... Tallahassee, Fla.
Florida Southern Ry. ..... 3 g. 91 m. 6 l.o. 96 cars.
J. D. Hollister, *Gen. Supt.* ..... Palatka, Fla.
Jas. D. Hollister, *Supt.* ..... Palatka, Fla.
M. R. Miller, *M. M. & C. B.* ..... Palatka, Fla.
Florida Transit R. R. ..... 5 g. 224 m.
D. E. Maxwell, *Gen. Supt.* ..... Fernandina, Fla.
John Hedges, *M. M.* ..... Fernandina, Fla.
R. V. Dahoney, *M. M.* ..... Fernandina, Fla.
G. Hernandez, *M. C. B.* ..... Fernandina, Fla.
Fonda, Johnst'n & Gloversv. Ry. 4-8½ g. 18 m. 2 l.o.
Lawton Caten, *Supt.* ..... Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 l.o. 35 c.
Alonzo Kinyon, *Supt. & P. A.* Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. ..... 4-8½ g.
Jas. D. Henderson, *Supt* ..... Fort Dodge, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 41 m. 4 l.o. 120 c.
S. B. Kenrick, *Supt. & Pur. Agt.* Ft. Madison, Ia
H. Wanen, *M. M. & C. B.* ..... Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 108 m. 3 l.o. 240 c.
White Water R. R. 4-8½ g. 62 m. 5 l.o. 170 cars.
W. W. Worthington, *Gen. Supt.* ..Ft. Wayne, Ind.
T. H. Haberkorn, *M. M.* ..... Ft. Wayne, Ind.
Wm. Knight, *M. C. B.* ..... Ft. Wayne, Ind.
Fulton County N. G. Ry. 3 g. 61 m. 3 l.o. 106 cars.
A. C. Atherton, *Gen. Supt. & P. Agt.* Lewistown, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 492 m. 92 l.o. 1870 cars.
A. N. Towne, *Gen. Man.* ..... Houston, Tex.
E. G. Thompson, *Supt.* ..... Houston, Tex.
El Paso Div.: Jas. Campbell, *Supt.* El Paso, Tex.
J. L. Bonner, *M. M.* ..... El Paso, Tex.
San Anto. Div.: W. G. Van Vleck, *Supt.* .....
J. J. Ryan, *M. M.* ..... San Antonio, Tex.
Houston Div.: H. Flanders, *Supt.* Harrisburg, Tex
D. T. Bell, *M. M.* ..... Harrisburg, Tex
Louisiana Div.: W. Irwin, *Supt.* ..... Houston, Tex.
C. Smith, *M. M.* ..... Houston, Tex.
Galveston, Houston & Henderson R. R.
4-8½ g. 50 m. 17 l.o. 212 cars.
W. H. Harding, *G. Man. & P. Agt.* Galveston, Tex
Allen McCoy, *Supt.* ..... Galveston, Tex
J. G. Conlon, *M. M.* ..... Galveston, Tex.
Genesee, Ithaca & Sayre R. R. ..... (*See Lehigh Val.*)
Georgia R. R. ..... 5 g. 307 m. 42 l.o. 938 cars.
John W. Green, *Gen. Man.* ..... Augusta, Ga.
John S. Cook, *M. M.* ..... Augusta, Ga.
M. Preval, *M. C. B.* ..... Augusta, Ga.
Georgia Pacific Ry. (Miss. Div.). 3 g. 43 m. 2 l.o. 44 c
G. J. Carbaccio, *Supt.* ..... Atlanta, Ga.
W. M. Sutton, *Pur. Agt* ..... Greenville, Miss.
Benj. Davis. *M. M.* ..... Greenville, Miss.
J. B. Sheldon, *M. C. B.* ..... Greenville, Miss.
Grand Haven R. R. ..... (*See Chic. & W. Mich.*)
Grand Junction Ry. ..... (*See Midland of Can.*)
Grand Rapids & Ind. ..... 4-8½ g. 330 m. 56 l.o. 1,191 c.
Grand Rapids & Indiana. 4-8½ g. 456 m. 52 l.o. 1,566 c.
W. O. Hughart. *Gen. Man.* Grand Rapids. Mich.
W. S. Shelby, *Gen. Pass. Agt* ..Grand Rapids, Mich.
S. D. Bradley, *M. M.* ..... Grand Rapids, Mich
No'n Div.: J. M. Metheany, *Supt.* G'nd Rap., Mich.
So'n Div.: P. S. Bantice, *Supt.* Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 l.o. 357 c.
T. M. Williamson, *Supt. & P. A.* Gr. Tower, Ill.
Hugh Bonnar, *M. M. & C. B.* ..Grand Tower, Ill.
Grand Trunk Ry. ..... 4-8½ g. 2,321 m. 434 l.o. 9,403 c.
Joseph Hickson, *Gen. Man.* ..... Montreal, Can.
Wm. Wainright, *Asst. Gen. Man.* ..... Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, *Supt.* Montreal, Can.
Jno. Taylor, *Gen. Storekeeper* Montreal, Can.
Herbert Wicks, *Mech. Supt.* ..... Montreal, Can.
Wm. McWood, *Supt. Car Dept.* Montreal, Can.
F. R. F. Brown, *Man. Lo. Wks* Montreal, Can.
J. Haskoni, *Div. M. S.* ..... Richmond, P. Q.
F. L. Wanklyn. *Div. M. S.* ..... Brockville, Ont.
J. Davis Barnett, *Div. M. S.* ..... Stratford, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 56 l.o. 1,191 c.
S. R. Callaway, *Gen. Man.* ..... Chicago, Ill.
W. H. Pettibone, *Supt.* ..... Battle Creek, Mich.
A. Judd, *Pur. Agt.* ..... Fort Gratiot, Mich.
H. Roberts, *Mech. Supt* ..... Port Huron, Mich.
Great West'n Div.: 4-8½ g. 823 m. 216 l.o. 5,030 c.
Chas. Stiff, *Supt.* ..... Hamilton, Ont.
E. R. Baines, *Store Kpr.* ..... London, Ont.
C. K. Domville, *Mech. Supt.* ..... Hamilton, Ont.
C. F. Hanson, *Lo. For.* ..... London, Ont.
J. D. McIlwain, *Supt. Car Dept.* ..London, Ont.
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 l.o. 590 cars.
Timothy Case, *Gen. Man. & P. A.* Green Bay, Wis.
A. Fenwick, *M. M.* ..... Ft. Howard, Wis.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 45 l.o. 1,400 c.
John Sealy, *Gen. Man.* ..... Galveston, Texas.
F. P. Killeen, *Asst. Gen. Man.* Galveston, Texas.
Jno. W. Thorne, *Pur. Agt.* ..... Galveston, Texas.
G. B. Nichols, *M. M.* ..... Galveston, Texas.
W. H. Martin, *M. C. B.* ..... Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 98 m. 0 l.o. 70 c.
M. D. Monserratze, *Pr. & Supt.* ..Cuero, Texas.
James Mooney, *M. M.* ..... Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 70 m. 9 l.o. 268 c.
H. Abbott, *Manager* ..... New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 202 m. 70 l.o. 1,800 c.
John B. Carson, *Gen. Man.* ..... Hannibal, Mo.
W. R. Woodard, *Supt.* ..... Hannibal, Mo.
T. L. Hunt, *Ch. Eng. & Pur. Agt.* ..Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep.* Hannibal, Mo.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 34 m. 2 l.o. 106 cars.
H. D. Scott, *Gen. Supt* ..... Hanover, Pa.
John J. Bingley *M. M.* ..... Hanover, Pa.
Henry Brinker, *M. C. B.* ..... Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 l.o. 24 c.
R. H. Middleton, *Supt.* ..... Bolling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 49 m. 0 l.o. 196 c.
Samuel Babcock, *Pr. & Gen. Man.* Hartford, Ct.
Levi Woodhouse, *Asst. Supt.* ..... Hartford, Ct.
S. E. Brewer, *M. M. & C. B.* ..... Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 l.o. 405 c.
John F. Jones, *Supt.* ..... Hartford, Ct.
J. C. Barton, *M. M.* ..... Hartford, Ct.
Housatonic R. R. ..... 4-8½ g. 126 m. 22 l.o. 495 cars.
W. Yeomans, *Supt.* ..... Bridgeport, Ct.
D. S. Draper, *Pur. Agt.* ..... Bridgeport, Ct.
S. Slingland, *M. M.* ..... Falls Village, Ct.
J. J. Ferris, *M. C. B.* ..... Falls Village, Ct.
Houston Belt Ry. ..... 4-8½ g. and 3 gauge. 5½ miles.
S. L. Werden, *V. P. & Gen. Man.* Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 120 m. 10 l.o. 478 c.
Paul Bremond, *Pr. & Pur. Agt.* ..Houston, Tex.
E. L. Bremond, *Gen. Man.* ..... Houston, Tex.
B. O. Tiffin, *M. M.* ..... Houston, Tex.
C. F. Schefewe, *M. C. B.* ..... Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 l.o. 2,593 c.
J. Waldo, *V. Pr. & Gen. Man.* ..Houston, Tex.
A. H. Swanson, *Gen. Tr. Man.* ..... Houston, Tex.
E. S. Larchar, *Pur. Agt* ..... New York, N. Y.
L. C. Noble, *Gen. M. M.* ..... Houston, Tex.
James McGee, *M. C. B.* ..... Houston, Tex.
So. & We. Divs.: M. G. Howe, *Supt.* Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, *Supt.* Dallas, Tex.
C. H. Burns, *Asst. M. M.* ..... Corsicana, Tex.
So.-We. Div.: Donald Allen, *Supt.* ..... Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 85 m. 5 l.o. 72 cars.
F. O. Wyatt, *Gen. Man.* ..... Clarinda, Ia.
M. B. Snyder, *M. M.* ..... Clarinda, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 l.o. 69 c.
Geo. F. Gage, *Gen. Supt.* ..... Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt.* ..Philadelphia, Pa.
William Barkla *M. M.* ..... Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,554 m. 224 l.o. 6,172 c.
Jas. C. Clark, *Gen. Man.* ..... Chicago, Ill.
E. T. Jeffery, *Gen. Supt* ..... Chicago, Ill.
C. A. Beck, *Asst. Gen. Supt.* ..... Chicago, Ill
O. Ott, *Pur. Agt.* ..... Chicago, Ill
Henry Schlacks, *S. of Mach.* ..... Chicago, Ill.
W. B. Snow, *M. M. Car Works* ..... Chicago, Ill.
Chic. Div.: T. J. Hudson, *Supt* ..... Cairo, Ill.
Wm. Renshaw. *Act. M. M.* ..... Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt.* ..... Pontiac. Ill.
Spring. Div.: W. Wilkinson, *Supt.* Springfield, Ill.
W. B. McKenna, *M. M.* ..... Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt.* ..... Amboy, Ill.
J. B. Adams, *M. M.* ..... Amboy, Ill.
So. Div.: David Oxley, *M. M.* ..... Centralia, Ill.
Ia. Div.: M. Gilleas, *Supt.* ..... Dubuque, Ia.
Thos. W. Place, *M. M.* ..... Waterloo, Ia.
Illinois Midland Ry. ..... 4-8½ g. 176 m. 12 l.o. 611 cars.
D. H. Conklin, *Rec. & Gen. Man.* ..... Decatur, Ill
O. E. Grady, *Trans. Agt.* ..... Decatur, Ill
Frank Young, *For. Shops* ..... Paris, Ill.
Illinois & St. Louis R. R. ..... 4-8½ g. 18 m. 5 l.o. 402 c.
Thos. McKissock, *Gen. Man.* ..... St. Louis, Mo.
C. H. Sharman, *Gen. Supt. & P. A.* St. Louis, Mo.
D. J. Timlin, *M. M.* ..... Belleville, Ill.
Charles Rothe, *M. C. B.* ..... E. St. Louis Ill.
Indiana, Bloomington & Western Ry.
4-8½ g. 712 m. 64 l.o. 3,650 cars.
C. E. Patterson, *Gen. Man.* ..... Indianapolis, Ind.
J. H. Wilson, *Gen. Supt* ..... Indianapolis, Ind.
H. C. Norton, *Pur. Agt* ..... Indianapolis, Ind.
R. Wanen, *M. M. & C. B.* ..... Indianapolis, Ind.
Peoria Div.: I. H. Wilson, *Supt.* Indianapolis, Ind.
E. Hiserodt, *M. M.* ..... Urbana, Ill.
St. Louis Div.: I. H. Wilson, *Supt* ..... Indianapolis, Ind.
John King, *M. M.* ..... Indianapolis, Ind.
Ohio Div.: D. R. Ennis, *Asst. Supt.* Springfield, Ill.
Jos. S. Pomeroy, *M. M.* ..... Sandusky, O.
Indiana, Illinois & Iowa R. R. ..... 63 miles.
F. M. Drake, *Gen. Man.* ..... Kankakee, Ill
J. T. Perkins, *Supt.* ..... Kankakee, Ill.
Indiana & Illinois Southern Ry. ..... 3 g. 89 m.
W. C. Lyon, *Gen. Man. & P. Agt.* Robinson, Ill.
J. S. Perkins, *M. M. & C. B.* ..... Effingham, Ill.
Indianapolis & Vincennes R. R. ..... (*See Penna. Co.*)
Intercolonial Ry. ..... 4-8½ g. 846 m. 135 l.o. 4,500 cars.
David Pottinger, *Chief Supt.* ..... Moncton, N. B.
T. V. Cooke, *Gen. Storekeeper* ..Moncton, N. B.
H. A. Whitney, *Mech. Supt.* ..... Moncton, N. B
Ewd. D. Shaffer, *M. C. B.* ..... Moncton, N. B.
Monc. Div.: J. E. Price, *Supt.* ..Cambellton, N. B.
Hal. & St. J. Div.: J. Wallace, *Supt.* Truro, N. B.
Levis Div.: A. McDonald, *Supt.* Rivière du Loup, Q
International Ry. ..... 4-8½ g. 69 m. 2 l.o. 12 cars.
D. E. McVey, *Supt* ..... Sherbrooke, Que.
International & Gt. N'n R. R. ..... (*See Penna. Co.*)
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 l.o. 11 c.
Wm. Bailey, *Pres. & Gen. Man.* ..Helena, Ark.
D. Stillinger, *Supt.* ..... Helena, Ark.
F. M. Green, *Pur. Agt.* ..... Helena, Ark.
Wm. Summers, *M. C. B.* ..... Helena, Ark.
Ithaca, Auburn & Western Ry. ..... 4-8½ g. 38 m.
Fred T. Peet, *Supt* ..... Auburn, N. Y.
Ira Dunning, *M. M.* ..... Auburn, N. Y.

J

Jacksonville So. E'n R. R. ..... 4-8½ g. 54 m. 5 l.o. 68 c.
E. S. Greenleaf, *Supt.* ..... Jacksonville, Ill.
Jacksonville Southern Ry. ..... 4-8½ g. 18 m.
Jacksonv., Pensacola & Mob. (*See Fla. Ce-t. & W.*)
Jamesville & Washington. ..... 4-8½ g. 22 m. 3 l.o. 24 c.
A. J. Perkins, *Gen. Manager* ..... Jamesville, N. C.
J. E. Lordley, *M. M. & C. B.* ..Dymond City, N. C.
Jeffersonv'l, Madison & Indpls. R. R. ..... (*See Pa. Co.*)
Jersey City & Albany R. R. ..... 4-5½ g. 36 m.
J. W. McCulloh, *Manager* ...Jersey City, N. J.

K

Kansas Central R. R. ..... (*See Union Pacific.*)
Kansas Cy, Lawrence & So. Kan. 4-8½ g. 306 m. 787 c.
C. C. Wheeler, *Gen. Man.* ..... Topeka, Kan
J. L. Bullen, *Supt.* ..... Lawrence, Kan.
F. M. Smith, *Pur. Agt.* ..... Topeka, Kan.
T. D. Volk, *M. M.* ..... Ottawa, Kan.
Kansas City, Fort Scott & Gulf R. R. ..... 4-8½ g.
Geo. H. Nettleton, *Gen. Man.* Kansas City, Mo.
L. W. Towne, *Gen. Supt.* ..... Kansas City, Mo.
H. P. Jacques, *Pur. Agt.* ..... Kansas City, Mo.
J. S. McCrum, *M. M.* ..... Kansas City, Mo.
A. N. Montier, *M. C. B.* ..... Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ g. 308 m. 38 l.o. 1,148 cars.
J. F. Barnard, *Gen. Supt. & P. A.* St. Joseph, Mo.
Wm. Irving, *Pur. Agt* ..... St. Joseph, Mo.
F. A. Chase, *M. M.* ..... St. Joseph, Mo.
Thos. Aylesbury, *G. For. Car. Dep.* St. Joseph, Mo.
Kendall & Eldred R. R. ..... (*See Olean, B. & W.*)
Kent Co.; Sm. & Del. Bay Rds. 4-8½ g. 50 m. 2 l.o. 13 c.
Fred Gerker, *Gen. Man.* ..... Chestertown, Md.
Kentucky Central R. R. 4-8 g. 150 m. 20 l.o. 350 cars.
G. W. Bender, *Supt.* ..... Covington, Ky.
A. H. Watts, *F. of Mach* ..... Covington, Ky.
J. L. Rathbone, *M. M.* ..... Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 l.o. 52 c
Geo. B. Harper, *Supt. & P. A.* Mt. Sterling, Ky.
S. P. Hatfield, *M. M.* ..... Mt. Sterling, Ky.
Kinzua R. R. ..... (*See Olean, B. & W.*)
Kingston & Pembroke Ry. ..... 4-8½ g. 65 m. 4 l.o. 76 c.
B. W. Rogers, *Supt.* ..... Kingston, Ont.
C. Gildersleeve, *Pur. Agt.* ..... Kingston, Ont.
Geo. Becker, *M. M.* ..... Kingston, Ont.
Knox & Lincoln R. R. ..... 4-8½ g. 49 m. 5 l.o. 75 cars.
C. A. Coombs, *Supt.* ..... Bath, Me.
Wm. A. Field, *M. M.* ..... Bath, Me.
C. L. Turner, *M. C. B.* ..... Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 l.o. 34 cars.
J. M. Hood, *Supt.* ..... Knoxville, Tenn.
M. R. Hood, *Pur. Agt* ..... Knoxville, Tenn.

L

Lackawanna & Pittsburg R. R. ..... 3 g. 2 l.o.
H. Batterson, *Gen. Supt.* ..... Friendsville, Pa.
Lake Erie & Western Ry. 4-8½ g. 388 m. 43 l.o. 1,526 c.
D. S. Hill, *Gen. Supt.* ..... La Fayette, Ind.
T. H. Hurry, *Pur. Agt.* ..... La Fayette, Ind.
H. L. Cooper, *Supt. of Equipment* ..Lima, O.
D. S. Hill, *Gen. Supt* ..... Sandusky, O.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,243 m. 546 lo. 17,115 cars.
John Newell, *Gen. Man.* ..... Cleveland, O.
P. P. Wright, *Gen. Supt.* ..... Cleveland, O.
A. C. Armstrong, *Pur. Agt* ..... Cleveland, O.
James Sedgley, *Gen. M. M.* ..... Cleveland, O.
John Dix, *M. C. B.* ..... Cleveland, O.
Buffalo Div.: C. B. Couch, *Supt.* ..Cleveland, O.
J. S. Graham, *M. M.* ..... Buffalo, N. Y.
A. C. Robson, *M. C. B.* ..... Buffalo, N. Y.
Frank. Div.: G. H. McIntire, *Supt.* Stoneboro, Pa.
Erie Div.: C. B. Couch, *Supt.* ..... Cleveland, O.
L. O. Gilbert, *M. M.* ..... Cleveland, O.
J. Withycombe, *M. C. B.* ..... Cleveland, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.* Cleveland, O.
J. M. Sanborn, *M. M.* ..... Toledo, O.
W. O. Smith, *M. C. B.* ..... Norwalk, O.
Mich. Div.: C. Curtis, *Supt.* ..... Toledo, O.
Det. Div.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing Div.: W. H. Canuff, *Supt.* Lansing, Mich.
Western Div.: Wm. Hamilton, *Supt.* Chicago, Ill.
G. W. Stevens, *M. M.* (M. S. Divs.) Elkhart, Ind.
Frank O. Bray, *M. C. B.* ..... Adrian, Mich.
Ft. Wayne Br.: W. H. Canuff, *Supt.* Jackson, Mich.
Kalamazoo Div.:
E. M. wattles, *Supt.* ..... Kalamazoo, Mich.
W. C. Alatyne, *Manager* ..... Albany, N. Y.
J. K. Hotaling, *Pur. Agt* ..... Albany, N. Y.
Geo. Toft, *M. M.* ..... Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 321 lo. 33,817 c.
H. S. Goodwin, *Gen. Supt* ..... Bethlehem, Pa.
W. C. Alderson, *Pur. Agt* ..... Philadelphia, Pa.
John S. Lentz, *M. C. B.* ..... Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt.* Perth Amboy, N. J.
John I. Kinsey, *M. M.* ..... So. Easton, Pa.
Coal Rds.: J. I. Blakeslee, *Supt.* Manch Chunk, Pa.
P. Hofecker, *M. M.* ..... Weatherly, Pa.
John Campbell, *M. M.* ..... Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.* Manch Chunk, Pa.
D. Clark, *M. M.* ..... Hazleton, Pa.
Wy. Div.

Goodell & Waters

PHILADELPHIA, PA.

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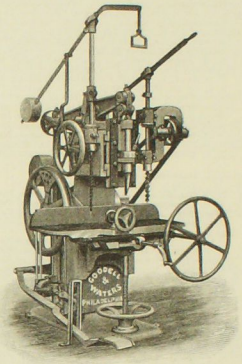

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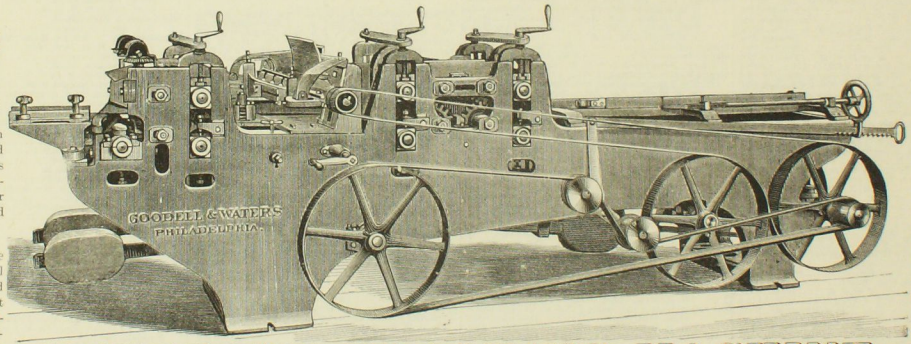
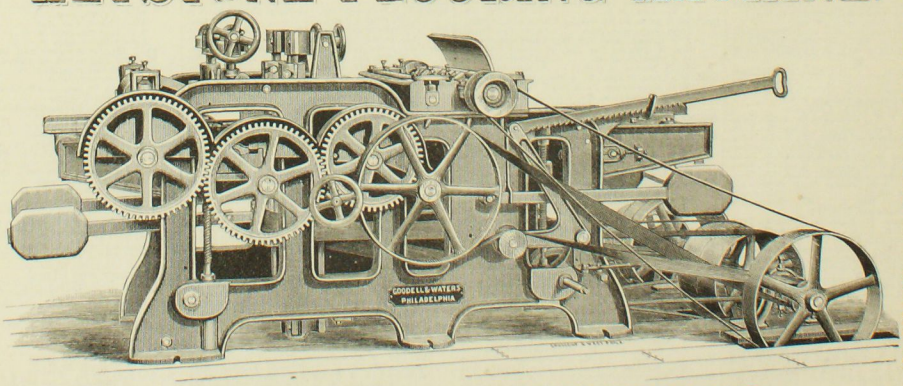


KEYSTONE FLOORING MACHINE.



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1)Missouri Pac.Ry. 4-8½ g.2,708 m.324 to.10,000 c
John Hewitt, *Supt. Mach*.....St. Louis, Mo.
Malo Line, Wander Cumming, *Supt.* Sedalia, Mo.
W. W. Fagan, *Supt.*..W'n Div., Atchison, Kan.
Le Roy Bartlett, *Asst. M. M.*.....St. Louis, Mo
Geo. Walshe, *M. M.*.....Sedalia, Mo
M., K. & Tex. Div., ...*Supt* Sedalia, Mo.
J. C. Barber, *Asst. Supt. Car Dep.*Sedalia, Mo.
J. W. Haines, *M. M.*.....Parsons, Kan.
Cen. Br. Div., W. W. Fagan, *Supt.* Atchison, Kan.
H. V. Faries, *M. M.*.....Atchison, Kan.
R. Irvin, *Asst. Supt. Car Dep.*..Atchison, Kan.
(1) St. L., I. M. & So. 4-8½ g. 859 m. 141 lo. 4,800 c.
Wm. Kerrigan, *Supt.*.....St. Louis, Mo.
O. A. Haynes, *S. M. P. & M.*.....De Soto, Mo.
St. Louis Div.: W. H. Harris, *M. M.*.De Soto, Mo.
Ark Div.: R. M. Richardson, *M. M.*Little Rock, Ark.
H. H. Sessions, *M. C. B.*.....Marshall, Tex.
(2) Texas & Pac. 4-8½ g. 1,487 m. 144 lo. 3,076 c.
J. M. Eddy, *Supt.*.....Dallas, Tex.
O. A. Haynes, *S. M. P. & M.*...Marshal, Tex.
H. H. Sessions, *M. C. B.*.....Marshall, Tex.
New Or. Div., J. T. Whedon, *Supt.*Gonzales, La.
Perry Stevens, *M. M.*.....Marshall, Tex.
Eastern Div.: J. Williams, *Supt.*..Longview, Tex.
Rio Gr. Div.: G. O. Clinton, *Supt.*Big Springs, Tex.
Wm. Foley, *M.M.*.....Big Springs, Tex.
(3) Int. & G.North. 4-8½ g. 770 m. 73 lo. 1,712 c.
Jos. Harris, *Supt.*.....Dallas, Tex.
O. A. Haynes, *S. M. P. & M.*...Palestine, Tex.
O. H. Johnson, *M. M.*.....Palestine, Tex.
H. H. Sessions, *M. C. B.*.....Marshall, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 50 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*.....Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars.
W. L. Clark, *Gen. Supt.*.....Columbus, Ga.
J. C. Albrecht, *M. M.*.....Colum'bus, Ga.
A. J. Nix, *M. C. B.*.....Columbus, Ga.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
G. Jordan, *V.-Pr. & Gen. Man.*....Mobile, Ala.
F. Jordan, *Pur. Agt.*.....Mobile, Ala.
R. H. Briggs, *Gen. M. M.*.....Whistler, Ala.
J. T. Booth, *M. C. B.*.....Whistler, Ala.
So'n Div., I. O. Motley, *Supt.*.....Mobile, Ala.
John Fitzgerald, *M. M.*.....Macon, Miss.
No'n Div., E. S. Horsford, *Supt.* Jackson, Tenn.
M. T. Carsen, *M. M.*.....Jackson, Tenn.
Mobile & Spring Hill R. R. 5 g. 8 m. 10 lo. 90 cars.
F. Ingate, *Supt.*.....Mobile, Ala.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 3 cars.
G. B. Weistling, *Supt. & P. A.*..Mont Alto, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 76c.
W. A. Stowell, *Supt.*.....Montpelier, Vt.
Morgan's Louisiana & Tex. R. R. 4-8½ g. 165 m.
J. Krutschnitt, *Supt.*.....New Orleans, La.
C. Trumpy, *Pur. Agt.*.....New Orleans, La.
N. Tilton, *M. M.*.....Algiers, La.
Wm. O'Brien, *M. C. B.*.....Algiers, La.
Muney Creek Ry. 4-8½ g. 10 m.
Benj. G. Welch, *Rec. & P. Agt* Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M.* do.

N

Nashville, Chattanooga & St. Louis R'y.
5 g. 508 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Supt. & P. Agt* Nashville, Tenn.
M. J. C. Wrenne, *Supt.*.....Nashville, Tenn.
James Cullen, *M. M. & C. B.*..Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 98 m. 7 lo. 72 c.
Alex. Frost, *Gen. Supt.*.....Natchez, Miss.
Naugatuck R. R., 4-8½ g. 61 miles, 14 lo. 384 cars.
Geo. W. Beach, *Supt.*.....Waterbury, Ct.
Henry Hanford, Jr., *Sec.*.....Bridgeport, Ct.
Geo. W. Gray, *M. C. B.*.....Bridgeport, Ct.
Nevada Central R. R. *(See Union Pac.)*
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 40 cars.
John F. Kidder, *Supt.*.....Grass Valley, Cal.
Jas. McCornick, *M. M. & C. B.*Grass Valley, Cal.
New Brunswick Ry. 4-8½ g. 194 m. 12 lo.
E. R. Burpee, *Gen. Man.*.....Gibson, N. B.
Henry Osborn, *Gen. Supt.*.....Gibson, N. B.
Alfred Seely, *Pur. Agt.*.....Gibson, N. B.
Jesse Mathews, *M. M.*.....Gibson, N. B.
T. N. Burpee, *M. C. B.*.....Gibson, N. B.
New Brunswick & Can. Ry. 4-8½ g. 127 m. 12 lo. 340c.
Henry Osborn, *G. M. & P. A.*St. Andrew's, N. B.
John Stewart, *Supt.*.....St. Stephen, N. B.
Alfred Armstrong, *M. M.*.....St. Andrew's, N. B.
G. Houlton, *M. C. B.*.....St. Andrew's, N. B.
New Haven & Derby R. R. 4-8½ g. 13 m. 3 lo. 38 c.
Edwin Quinard, *Supt.*.....New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.*New Haven, Conn.
New Haven & N'mpton. 4-8½ g. 135 m. 20 lo. 572 c.
S. B. Updike, Jr., *Supt.*.....New Haven, Ct.
C. N. Yeamans, *Pur. Agt*.....New Haven, Ct.
Henry Fox, *M. M.*.....New Haven, Ct.
John Sweeny, *M. C. B.*.....New Haven, Ct.
New Jersey & New York Ry. 4-6 g. 43 m. 6 lo. 440 c.
J. D. Hasbrouck, *Gen. Man* Jersey City, N. J.
J. B. Drake, *Supt. & M. M.*.....Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B.*.....Hillsdale, N. J.
New Jersey Southern Ry. *(See Central, N. J.)*
New London Northern R. R. *(See Central Ver.)*
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars
H. S. Morse, *Supt.*.....New Orleans, La.
E. R. Smith, *M. M. & C. B.*..New Orleans, La.
N. Y. Central & Hudson River R.R.
4-8½ g. 962 m. 476 lo. 22 539 cars.
J. M. Toucey, *Gen. Supt.*.....New York, N. Y.
R. C. Moore, *Pur. Agt*.....New York, N. Y.
Wm. Buchanan, *Supt. M. P.*.....New York, N. Y.
L. Garey, *Supt. Car Dept.*.....New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt* do.
Wm. McAg (Hixon, *M. M.*.....New York, N. Y.
C. E. Garey, *M. C. B.*.....Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt.*N. York, N. Y.
Peter Smith, *M. C. B.*.....New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*.....Utica, N. Y.
John Orton, *M. M.*.....West Albany, N. Y.
D. Holt, *M. C. B.*.....West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt.* Rochester, N. Y.
S. L. White, *M. M.*.....Syracuse, N. Y.
Amos Gould, *M. M.*.....E. Buffalo, N. Y.
E. A. Olmstead, *M. C. B.*...E. Buffalo, N. Y.
C. H. Burchard, *M. C. B.*..E. Rochester, N. Y.
Rd. Donaby, *M. C. B.*.....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 269 m. 115 lo. 4,838 c.
Lewis Williams, *Gen. Man*.....Cleveland, O.
Jno. Newell, *Supt.*.....Cleveland, O.
Jno. W. Dougherty, *Pur. Agt.*.....Cleveland, O.
Jno. Mackenzie, *Supt. M. P.*.....Cleveland, O.
Eas'n Div.: G. H. Kimball, *Supt.*...Cleveland, O.
E. A. Miller, *M. M.*.....Conneaut, O.
West'n Div.: A. H. Evans, *Act. Supt.* Chicago, Ill.
Jas. Dorland, *M. M.*.....Bellevue, O.
New York City & Northern. 4-8½ g. 54 m. 9 lo. 368 c.
Frank S. Gannon, *Gen. Supt.* High Bridge, N. Y.
Theo. Wheeler, *M. M.*.....High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4-8½ g. 1,020 m. 568 loco. 30,500 cars.
Robt. Harris, *V. Pr. & Gen. Man.*New York, N. Y.
E. S. Bowen, *Gen. Supt.*.....New York, N. Y.
J. A. Hardenburg, *Pur. Agt.*.....New York, N. Y.
F. M. Wilder, *Supt. M. P. & M.*..Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt.*.....Jersey City, N. J.
J. H. Vreeland, *M. M.*.....Jersey City, N. J.
J. N. Wiseman, *M. C. B.*.....Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt.*..Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.*Port Jervis, N. Y.
Susq. Div.: I. Jolls, *Supt.*.....Elmira, N. Y.
V. Blackburn, *M. M.*.....Susquehanna, Pa.
Isaiah Goodell, *M. C. B.*.....Elmira, N. Y.
Buf. & R. Divs.: Chas. Nellson, *Supt.*land.
G. B. Ross, *M. M.*.....Buffalo, N. Y.
M. Wilder, *M. C. B.*.....Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt* do.
W'n Div.: W. B. Coffin, *Supt.*Hornellsville, N. Y.
Geo. H. Griggs, *M. M.*.....Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man.*New Haven, Ct.
R. N. Dowd, *Pur. Agt*.....New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt.* N. Y.
Shore Line Div.:
O. M. Shepard, *Supt*.....N. Haven, Ct.
Air Line Div.: O. M. Shepard *Supt.*N. Haven, Ct.
H. Ketteadorf, *Supt. M. P.*...New Haven, Ct.
Jas. Denver, *M. C. B.*.....New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt.*...Hartford, Ct.
John Henny, Jr., *Supt. M. P. & M. C. B.*... do.

New York, Ontario & Western Ry.
4-8½ g. 240 m. 70 lo. 1,530 cars.
Chas. Paine, *Gen. Man.*.....New York, N. Y.
J. W. Fowler, *Pur. Agt.*.....Middletown, N. Y.
R. H. Soule, *Supt. M. P.*.....New York, N. Y.
Edw. Minshull, *M. M. & C. B.*Middletown, N. Y.
Mid. Div.: N. R. Hankins, *Supt.* Middletown, N. Y.
No'n Div.: C. W. Lampher, *Supt.*....Norwich, N. Y.
So. Div.: E. Canfield, *Supt*.....Tappan, N. Y.
New York, Pennsylvania & Ohio R. R.
4-8½ g. 504 m. 218 lo. 7,304 cars.
J. M. Ferris, *Gen. Man.*.....Cleveland, Ohio
J. H. Rinaway, *Pur. Agt.*.....Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B.*...Cleveland, O.
S. S. Smith, *Asst. Gen. M. C. B.*.....Kent, Ohio.
E'n div.: A. L. Dunbar, *Supt.*.....Meadville, Pa.
J. A. Cooper, *M. M.*.....Meadville, Pa.
D. S. Dockstader, *M. C. Rep.*...Meadville, Pa.
J. T. Fosdick, *For. Car Rep.*Salamanca, N. Y.
W'n Div.: J. W. Alsop, *Supt*.....Galion, O.
Wm Hill, *M. M.*.....Galion, O.
J. W. Holmes, *For. Car Rep.*.....Galion, O.
Geo. Wilson, *For. Car Rep*.....Dayton, Ohio.
Maho'g Div.: S. F. Wood, *Supt.*.....Cleveland, O.
N. Wright, *M. M.*.....Cleveland, O.
C. N. Thorp, *M. C. Rep*.....Cleveland. O.
New York, Providence & Boston R. R.
4-8½ g. 72 m. 29 lo. 430 cars.
J. B. Gardner, *Supt.*.....Providence, R. I.
Giles F. Ward, *Pur. Agt.*.....Stonington, Conn.
J. H. Anderson, *M. M. & C. B.*Providence, R. I.
N. Y., Susquehanna & W'n. 4-0 g. 13 m. 28 lo. 925 c.
F. A. Hyde, *Supt.*.....Jersey City, N. J.
C. D. McKelvey, *Asst. Supt.*..Jersey City, N. J.
C. T. Demarest, *Pur. Agt.*.....New York, N. Y.
W. C. Hunt, *M. M.*.....Wortendyke, N. J.
New York, West Shore & Buffalo Ry.
Chas. Paine, *Gen. Man.*.....New York, N. Y.
R. H. Soule, *Supt. M. P.*.....New York, N. Y.
P. S. Bemis, *Pur. Agt*.....New York, N. Y.
Harry Linn, *M. M.*
Walkill Div., Giraves, *Supt.*..Rondout, N. Y.
New York, Woodhaven & Rockaway R. R.
4-8½ g. 26 m. 8 lo. 101 cars.
J. M. Hunt, *Supt. of P. and Apt.* Hunter's Pt., L. I.
W. B. Turner, *M. M.*.....Hunter's Point, L. I.
N. Y. & Greenwood Lake Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt.*.....Jersey City, N. J.
J. A. Hardenburg, *Pur. Agt.*.....New York, N. Y.
G. A. Hill, *M. M.*.....Pompton, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo. 128 c.
D. C. Corbin, *Man. Dir.*.....New York, N. Y.
O. Fairhurst *M. M.*.....Greenpoint, L. I.
New York & New Engl'd R. R.
4-8½ g. 463 m. 127 lo. 3,326 cars.
S. M. Felton, Jr., *Gen. Man.*.....Boston, Mass.
W. W. McKim, *Pur. Agt*.....Boston, Mass.
Ross Kells, *Supt. M. P.*.....Boston, Ma-s.
A. K. Mansfield, *Mech. Eng*.....Boston, Mass.
W. G. Tabor, *M. M.*.....Boston, Mass.
H. E. Barker, *Gen. Fore*.....Norwood, Mass.
East Div.: C. C. F. Bent, *Supt*.....Bost'n, Mass.
Nor. Div.: P. M. Andrews, *Supt.*..Norwich, Ct.
W. A. Stone, *M. M.*.....Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt.*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*.....Hartford, Ct.
E. M. Humstone, *M. M.*.....Hartford, Ct.
D. F. Andregg, *For. C. Dept*.....Hartford, Ct.
Newburg, Dutchess & Conn. R. R. 4-8½ g. 58 miles.
C. L. Kimball, *Gen. Supt.*..Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.*
Dutchess Junction, N. Y.
Norfolk Southern R. R. 4-8½ g. 70 m. 6 lo. 158 c.
M. K. King, *Gen. Man. & Pur. Agt.*Norfolk, Va.
W. H. Unsworth, *M. M. & C. B.*.....Norfolk, Va.
Norfolk & Western R. R. 5 g. 428 m. 82 lo. 1,220 c.
J. H. Sands, *Gen. Supt.*.....Lynchburg, Va.
W. C. De Armond, *Pur. Agt*...Philadelphia, Pa.
C. Blackwell, *Supt. M. P.*.....Roanoke, Va.
West'n Div.: Frank Huger, *Supt.*..Lynchburg, Va.
F. Sisson, *M. M.*.....Lynchburg, Va.
East'n Div.: N. M. Osborne, *Supt.*..Petersburg, Va.
Clifford Ashton, *M. M. & C. B.*.....Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, *Supt.*.....Athens, Ga.
North Eastern R. R. of S. C. *(See W'n. & W'd.)*
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
David Nye, *Gen. Supt.*.....San Rafael, Cal.
W. F. Russell, *Pur. Agt*.....San Francisco, Cal.
J. Fowler, *M. M.*.....Sancelito Cal.
North Shore .....Quebec, Can.
Northern, *Gen. Man.*.....Quebec, Can.
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 960 cars.
Geo. E. Todd, *Supt.*.....Concord, N. H.
M. M. & C. B. & Pur. Agt. do.
Northern (N. J.) R. R. *(See N. Y., L. E. & W'n.)*
Northern Central Ry. *(See Penna. (R.R.)*
North'n Pacific R. R. 4-8½ g. 1,193 m. 104 lo. 3,089 c.
Herman Haupt, *Gen. Man.*.....St. Paul, Minn.
John H. Amidon, *Pur. Agt*.....St. Paul, Minn.
J. T. Odell, *A. Gen. Man.*.....St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P. & R. S.*..do.
First Grand Div.: M. C. Kimberly, *Supt.*...do.
H. J. Small, *A. S. Mach.*.....Brainerd, Minn.
Frank Howard, *M. C. B.*.....Brainerd, Minn.
Sec. Grand Div.: J. M. Graham, *Supt.* Fargo, Dak.
A. Rupert, *M. M.*.....Fargo, Dak.
E. F. Doran, *M. M.*.....Mandan, Dak.
Third Grd Div.: S. R. Kimslie, *Supt.* Glendive, Mont.
S. L. Bean, *M. M.*.....Glendive, Mont.
G. S. La Rue, *M. M.*.....Billings, Mont.
(2) Western Div.: J. M. Buckley, *A. G. M.*; and
Otis Sprague, *Supt.*.....New Tacoma, W. T.
H. D. Sanborn, *Pur. Agt*.....Portland, Ore.
W. T. Small, *A. S. Mach.*(W. D. Sprague, W. T.
Robt. Walker, *M. C. B.*.....Sprague, W. T.
F. C. Ford, *M. M.*.....New Tacoma, W. T.
S. Eveleth, *M. C. B.*.....New Tacoma, W. T.
Pend d'Oreille Div.
F. F. Griffin, *Supt.*.....Ainsworth, W. T.
J. Evans, *M. M.*.....Sprague, W. T.
Northern & North-W'n Ry. 5-6 & 4-8½ g. 50 lo. 1,033 c.
James Webster, *Supt.*.....Toronto, Can.
W. C. Schneider, *Pur. Agt*.....Toronto, Can.
P. Clarke *M. M.*.....Toronto Can.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,160 cars.
A. A. Gaddis, *Gen. Man.*.....Ogdensburg, N. Y.
Abr. Kohn, *Supt. of M. M.*.....Malone, N. Y.
J. F. Brown, *M. C. B.*.....Malone, N. Y.
Ohio Central R. R. 4-8½ g. 230 m. 45 lo. 4,760 cars.
John R. Bartlett, *Gen. Man.*.....Toledo, O.
T. M. Peeler, *Supt.*.....Bucyrus, O.
F. W. Stewart, *Pur. Agt*.....Toledo, O.
H. Swargan, *M. M. & C. B.*.....Bucyrus, O.
Ohio Southern. 4-8½ g. 119 m. 10 lo. 623 cars.
D. R. Ennis, *Supt.*.....Springfield, O.
H. C. Symmes, *Pur. Agt*.....Indianapolis, Ind.
W. B. Warren, *M. M.*.....Springfield, O.
Ohio & Mississippi Ry. 4-8½ g. 615 m. 112 lo. 2,501 cars.
W. W. Peabody, *Gen. Man.*.....Cincinnati, O.
G. E. Atwood, *Pur. Agt*.....Cincinnati, O.
J. H. Setchel, *Gen. M. M.*.....Cincinnati, O.
Cin. Div.: J. B. Cole, *Supt*.....Seymour, Ind.
John Thumser, *M. M.*.....Seymour, Ind.
J. P. Coulter, *M. C. B.*.....Aurora, Ind.
Arthur Donaldson, *M. M.*.....Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt.* St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring Div.).Pana, Ill.
Louis Div.: C. B. Cole, *Supt*.....Louisville, Ky.
Oil City & Chicago R. R. 4-9 g. 36 m. 6 lo. 50 cars.
A. Vandivort, *Supt.*.....New Castle, Pa.
Oil City & Ridgway R. R. 4-8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, *Gen. Man.*.....Oil City, Pa.
Old Colony R. R. 4-8½ g. 403 m. 110 lo. 2,867 cars.
J. M. Kendrick, *Gen. Man.*.....Boston, Mass.
Main Li. Div.: J. H. French, *Supt.*..Boston, Mass.
H. K. Hunted, *Pur. Agt*.....Boston, Mass.
J. K. Taylor, *M. M.*.....Boston, Mass.
M. C. B......Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt.* Hyannis, Mass.
No. Div.: S. A. Webber, *Supt.*....Fitchburg, Mass.
George W. Reynolds, *M. M.*.....Taunton, Mass.
Sam. Stevens, *M. C. B.*.....Taunton, Mass.
Olean, Bradford & Warren: Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Watson, *Gen. Supt.*.....Olean, N. Y.
J. H. Poole, *Pur. Agt*.....Buffalo, N. Y.
Charles Turner, *M. M. & C. B.*.....Olean, N. Y.
Oregon Ry. & Nav. Co. 4-8½ g. 225 m. 31 lo. 930 cars.
C. H. Prescott, *Manager*.....Portland, Ore.
K. Von Otterendorf, *Supt.* (O. Div.) S. P. Co.Cal.
H. S. Rowe, *Supt.* (Ry Div.).....Portland, Ore.
J. M. Drake, *Pur. Agt*.....Portland, Ore.
C. C. Hobart, *Gen. M. M.*.....The Dalles, Ore.
Chas. A. Phipps, *M. C. B.*.....The Dalles, Ore.
N. G. Div.: Wm. Reed, *Man.*.....Portland, Ore.
James Welch, *M. M.*.....Portland, Ore.
Oregon & California R. R. 4-8½ g. 200 m. 14 lo. 280 c
R. Koehler, *Act. Man.*.....Portland, Ore
J. Brandt, *Gen. Supt.*.....Portland, Ore.
A. Brandt, *M. M.*.....Portland, Ore.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
R. S. Fryer, *Act. Supt.*.....Owensboro, Ky.
H. M. Gabel, *M. M. & C. B.*...Owensboro, Ky.

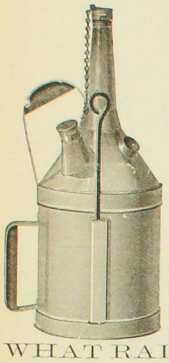
P

Pacific Coast Ry. 3 g. 11 m.
J. M. Fillmore, *Manager* San Luis Obispo, Cal.
W. H. Masterman, *M. M. & C. B.*.....do.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, *Rec. & Man.*.....Painesville, O.
J. A. Newcome, *Supt*.....Painesville, O.
E. B. Baldwin, *M. M.*.....Painesville, O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, *Supt.*.....Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt.*.....New York, N. Y.
D. P. Wright, *M. M.*.....Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Moberly *Gen. Supt.*.....Parker City, Pa.
Philip Davies, *M. M.*.....Parker City, Pa.
Wm. Wolford, *M. C. B.*.....Parker City, Pa.
Passumpsic R. R. 4-8½ g. 145 m. 28 lo. 980 cars.
E. Raymond, *Pres. & Pur. Agt.*..Boston, Mass.
H. E. Folsom, *Supt.*.....Lyndonville, Vt.
L. L. Brigham, *M. M.*.....Lyndonville, Vt.
L. B. Wood, *Supt. of P.*.....Lyndonville, Vt.
E. H. Willins, *M. C. B.*.....York, Pa.
E. Div.: S. Dickey, *Supt*.....Oxford, Pa.
W. P. Smith, *M. C. B.*.....Oxford, Pa.
Pennsylvania Co.'s (9) Roads.
4-9 g. 3,838 m. 817 lo. 29,432 cars.
Wm. Millins, *Gen. Pur. Agt.*.....Pittsburg, Pa.
Joseph Wood, *Supt. M. P.*.....Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4-9 g. 224 m. 97 lo. 3,336 c.
R. F. Smith, *Asst. Man.*.....Cleveland, O.
Philip Bruner, *Supt*.....Wellsville, O.
W. F. Beardsley, *Mast. of Mech.* Wellsville, O.
(2 & 3) Erie & Pittsburgh Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, *Supt.*.....Youngstown, O.
J. A. Wood, *Gen. For. Shops*.....Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 363 cars.
Jas. J. Turner, *Supt*.....Indianapolis, Ind.
(5) Jeffersonville, Madison & Indianapolis R. R.
4-8½ g. 417 m. 47 lo. 784 cars.
E. W. McKenna, *Supt*.....Louisville, Ky.
Wm. Swanston, *M. M.*.....Jeffersonville, Ind.
Jno. Austin, *M. C. B.*.....Jeffersonville, Ind.
(6) Northwestern Ohio Ry. 4-9 g. 79 m.
J. S. Morris, *Supt*.....Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: John Thomas, *Supt*.....Allegheny, Pa.
Geo. J. Parkin, *M. M.*.....Allegheny, Pa.
D. M. Peppard, *M. M.*.....Crestline, O.
W'n Div.: John Thomas, *Supt*..Ft. Wayne, Ind.
W. S. Rogers, *M. M.*.....Ft. Wayne, Ind.
A. H. Somers, *Gen. For. Shops*...Chicago, Ill.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4-9 g. 172 m. 336 lo. 6,435 cars.
Jas. McCrea, *Gen. Supt.*.....Columbus, O.
E. B. Wall, *Supt M. P. & M.*.....Columbus, O.
P. & Col. Div.: E. B. Taylor, *Supt*..Dennison, O.
C. B. Street, *M. M.*.....Dennison, O.
Robt. Curtis, *M. M.*.....Columbus, O.
Thos. Cumberland, *M. C. B.*.....Columbus, O.
C. & M. V. Div.: W. F. Black, *Supt.* Zanesville, O.
Leroy Kells, *M. M.*.....Cincinnati, O.
Daniel Kells, *M. C. B.*.....Lancaster, O.
Li. Mi. Div.: Ralph Peters, *Supt*.....Cincinnati, O.
Leroy Kells, *M. M.*.....Cincinnati, O.
Jos. Underwood, *Gen. For. man.*Cincinnati, O.
Ind. Divs.: J. F. Miller, *Supt*.....Richmond, Ind.
W. W. Reynolds, *M. M.*.....Logansport, Ind.
Chas. H. Starr, *M. C. B.*.....Logansport, Ind.
W. C. Arp, *Gen. For.*.....Indianapolis, Ind.
Chi Div.: Chas. Watts, *Supt.*..Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4-9 g. 374 m. 83 lo. 2,868 cars.
Joseph Hill, *Gen. Supt.*.....St. Louis, Mo.
C. E. Peddle, *P. Agt*.....St. Louis, Mo.
Geo. H. Prescott, *S. M. P. & M.*Terre Haute, Ind.
E. D. Carter, *M. C. B.*.....Terre Haute, Ind.
Clinton Hiller, *M. M.*.....Indianapolis, Ind.
Chas. Butler, *M. M.*.....Effingham, Ill.
A. W. Quackenbush, *M. M.*.....Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 2,704 m. 1,271 loco. 51,804 cars.
Chas. E. Pugh, *Gen. Man.*.....Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.....Philadelphia, Pa.
John Reilly, *Supt. Trans.*.....Philadelphia, Pa.
T. N. Ely, *Gen. M. P.* (4 Gen. Divs.)Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,105 m. 627 lo. 35,583 cars.
S. M. Prevost, *Gen. Supt.*.....Altoona, Pa.
Frank L. Sheppard, *Supt. M. P.*..Altoona, Pa.
G. W. Stratton, *M. M.*.....Altoona, Pa.
Jos. Wood, *Gen. Fore.*.....Altoona, Pa.
Phila. Div.: Thos. Gucker, *Supt.* Philadelphia, Pa.
H. D. Garrett, *M. M.*.....W. Philadelphia, Pa.
I. W. Van Houten, *Gen. For.*.....W. Phila, Pa.
Mid. Div.: O. E. McClellan, *Supt.* Harrisburg, Pa.
E. L. Caum, *M. M.*.....Harrisburg, Pa.
Samuel Rivers, *Gen. For.* Harrisburg, Pa.
Alt'a Div.: Jas. Reed, *Supt*.....Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*...Pittsburg, Pa.
D. O. Shaw, *M. M.*.....Pittsburg, Pa.
J. G. Stewart, *Gen. For.*.....Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt.* Blairsville, Pa.
Wm. H. Norris, *M. M.*.....Blairsville, Pa.
M. H. Fails, *Gen. For.*.....Blairsville, Pa.
Fred. Div.: J. B. Hutchinson, *Supt*.....York, Pa.
Tyrone Div.: S. S. Blair, *Supt*.....Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt* Lewistown, Pa.
Bed. Div.: R. L. Holliday, *Supt*.....Bedford, Pa.
Monon. Div.: David M. Watt, *Supt.* Lafayette, Ind.
Wm. Lininger, *M. M.*.....Pittsburg, Pa
(2) United R. Rs. of N. J. Divs. 414 m. 257 lo. 4,668 c.
F. W. Whittaker, *Gen. Sit. Jersey City, N. J.*
N. Y. Div.: Robt. E. Pettit, *Supt* Jersey City, N. J.
H. S. Hayward, *M. M. P.*.....Jersey City, N. J.
David H. Baker, *Gen. For.* Jersey City, N. J.
L. A. Bosdevex, *M. M.*.....Jersey City, N. J.
H. Bosdevex, *Gen. For.*.....Jersey City, N. J.
Belv. Div.: J. Anderson, *Supt.* Lambertv., N. J.
R. McDowell, *M. M.*.....Lambertville, N. J.
Amboy Div.: J. S. Buckalew, *Supt.* Camden, N. J.
Thos. Kerr, *M. M.*.....So. Amboy, N. J.
P. S. Bogart, *Gen. For.*.....So. Amboy, N. J.
(3) West Jersey R. R. 4-9 g. 163 m. 39 lo. 1,400 cars.
Joseph Crawford, *Supt*.....Camden, N. J
W. McAllister, *M. M.*.....Camden, N. J.
C. Gilbert, *Gen. For.*.....Camden, N. J.
Phila., Wilm. & Balt. R.R. 212 m. 86 lo. 1,488 c.
H. F. Kenney, *Gen. Supt.*.....Philadelphia, Pa.
S. A. Hilborn, *Gen. Pur. Agt*.....Philadelphia, Pa.
W. H. Lungren, *Gen. For.*.....Wilmington, Del.
Cen. Div.: T. A. Roberts, *Supt.* Philadelphia, Pa.
D. D. Dunfield, *M. M. & C. B.*.....Chester, Pa.
Del. Div.: I. N. Mills, *Supt.*.....Wilmington, Del.
J. A. Bayard, *M. M.*.....Oxford, Md.
C. E. Mason, *M. C. B.*.....Oxford, Md.
Mc. Div.: H. H. Carter, *Supt*.....
(5) Phila. & Erie R. R. Divs.: 376 m. 117 lo. 3,481 c.
R. Nelson, *Gen. Supt.*.....Williamsport, Pa.
A. O. Dayton, *Supt. Mo. Po.* Williamsport, Pa.
E'n. Div.: *Supt* Williamsport, Pa.
Sun. Hl. & W. Div.: A. Walters, *Supt.*; and
H. K. Stout, *M. M.*.....Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, *Supt.*.....Renova, Pa.
Wm. L. Holman, *M. M.*.....Renova, Pa.
West'n Div.: J. W. Reynolds, *Supt.*..Erie, Pa.
W. T. Smith, *M. M.*.....Erie, Pa.
(6) Northern Central Ry. 4-9 g. 326 m. 152 lo. 6,163 c.
Robert Neilson, *Gen. Supt.*.....Williamsport, Pa.
A. O. Dayton, *Supt. M. P.*.....Williamsport, Pa.
A. W. Sumner, *Pur. Agt*.....Baltimore, Md.
Susq. Div.: A. Walters, *Supt.*...Williamsport, Pa.
Sham. Div.: *Supt*.....Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt.* Elmira, N. Y.
Jas. Strode, *M. M.*.....Elmira, N. Y.
J. C. Dyott, *Gen. For.*.....Elmira, N. Y.
Baltimore Div.: H. W. Knapp, *Supt.* Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 128 m. 29 lo. 356 c.
L. K. Lodge, *Gen. Supt.*.....Baltimore, Md
A. W. Sumner, *Pur. Agt*.....Baltimore, Md.
J. M. Wallis, *Supt. Mo. Po*.....Baltimore, Md.
J. M. Coale, *M. M.*.....Baltimore, Md.
G. W. Demarest, *Gen. For.*.....Baltimore, Md.
Penn. Coal Co.'s R. R. 4-9 g. 67 m. 23 reg. 2,871 c.
J. B. Smith, *Gen. Supt.*.....Dunmore, Pa
And. Crane, *M. M.*.....Dunmore, Pa.
Geo. W. Simpson, *M. C. B.*.....Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*.....Ridgeway, Pa.
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 75 cars.
B. F. Simmons, *Pr. & Supt.*.....Pensacola, Fla.
H. W. Simmons, *Pur. Agt*.....Pensacola, Fla.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,458 cars.
G. L. Bradbury, *Gen. Man.*.....Peoria, Ill.
P. Reilly, *M. M.*.....Mattoon, Ill.
Peoria & Farmington R. R. 4-8½ g. 25 m. 2 lo. 25 c.

NOYES'

Patent Liquid and Condensed COOLER.

For Cooling Railroad Car and Steamboat Journals and Bearings of all Kinds, and for Mixing with Other Oils.



The attention of those who are running heavy journals is respectfully invited to the above Liquid Cooler. It has been successfully used for upward of ten years, and is constantly growing in favor, as its merits become known, and we are confident that practical men cannot fail of being convinced that our preparation deserves their candid attention. What we claim for it is:

That it will Cool a Hot Journal When in Motion, and extinguish the flame when the box is on fire; that its use will, in a great measure, prevent the occurrence of a hot journal, and save the expense, delays and annoyances incident thereto; that it will eliminate the heat from a journal at a temperature greatly below the point required to melt the babbitt, preventing the accumulation of heat, and by a timely application save it from destruction; that its non-inflammable elements (where waste is used) permeate the waste and prevent its taking fire; that it keeps the journal smooth and polished, preventing unnecessary friction; that its combination is based upon true scientific principles, which renders it impossible to fail in its results, and is the

Only Preparation that will Cool a Hot Journal while it is in motion, as attested by certificates below; that one thorough application on a hot journal will do more execution in cooling than the constant application of water for half an hour, besides doing it evenly and without loss of time.

Every Railroad Train or Steamboat should have a can of the Liquid Packing on board, with the directions for its use pasted upon it, and thus have always at hand the means of effectually cooling a hot journal, and thereby avoid the expense, danger and trouble from this cause.

WHAT RAILROAD MEN SAY OF IT.

SALEM, Aug. 7, 1873.

MR. P. NOYES.—*Dear Sir:* I have been using your Liquid Packing for cooling car journals for some time past, and have been well pleased with it. I have had occasion to use it a number of times, under Pullman cars, and it has been a complete remedy in every case of hot journals.

Every train should be provided with it, as it is a saving of time and expense in the running of trains, provided it is applied and cared for according to directions for using.

Yours truly,
J. P. SOMERBY,
M. C. B. Eastern Railroad.

SALEM, Aug. 28, 1880.

I can recommend Noyes' Liquid Cooler as an excellent article to carry on trains for use in case of Hot Journals, which it cools, without injury to the journals, more effectually than anything I know of.

J. H. BILLINGS,
M. C. B. Eastern Railroad.

BOSTON, April 7, 1880.

P. NOYES, Agent.—*Dear Sir:* Please send for account of Eastern Railroad five barrels Liquid Cooler.

GEO. J. FISHER, P. A.

BOSTON, May 24, 1877.

P. NOYES, Agent.—*Dear Sir:* Having used your Liquid Cooler two or three years, I find it necessary for the safe running of our cars to continue its use. When the cooler is mixed with black oil, according to directions, the compound is equal to lard or sperm oil, and it is the best Cooler I have ever used.

Yours truly,
JOHN F. CROCKETT,
Master Mechanic Boston, Lowell & Nashua R. R.

BOSTON, April 23, 1880.

BELT AND LEATHER STUFFING CO.—*Gents:* Please send to East Cambridge, for account Boston & Lowell Railroad, five barrels Liquid Cooler.

Yours truly,
F. H. NOURSE,
Purchasing Agent.

Our Liquid Cooler is now in use, and has been from one to eight years, upon the following roads, and we have numerous recommendations from them: Boston & Maine R. R., Boston & Lowell R. R., Intercolonial R. R., Boston, Concord & Montreal R. R., Fitchburg R. R., Eastern R. R., New York, New Haven & Hartford R. R., New York & New England R. R., Connecticut River R. R., Delaware & Hudson Canal Co., Old Colony.

In ordering state whether it is desired for general Lubricating or Cooling. The Condensed is sold, especially for Lubricating, by the Pound, and the Liquid by the Gallon, as low as any article of the quality in the market.

SEND FOR A BARREL. NO CHARGE UNLESS IT DOES ALL WE STATE.

MANUFACTURED BY THE

NOYES MANUFACTURING CO., P. Noyes, General Manager,

47 INDIA STREET, BOSTON.

We are sole agents for the Swift "Muffler" for Locomotives, Improved Car Axle-Box Dust Guard, and are Agents for the Ormsby Patent Car-Sash Balance and Lock.

J. NOYES SMITH & CO.,

BUILDERS OF

NUT, BOLT AND WASHER MACHINERY

AND MANUFACTURERS OF

NUTS, BOLTS, WASHERS, PLOW BOLTS, Etc.

59 & 61 S. WATER ST., CLEVELAND, O.

NATIONAL RAILWAY PATENT WASTE COMPANY.

The most economical, efficient and desirable material for packing JOURNAL BOXES of CARS is Cotton Seed Hulls.

The company proposes to license railroads to use this valuable article for packing, on very liberal terms Send for circular to

H. W. GUERNSEY, President,
240 Broadway, New York.

JOYCE, CRIDLAND & CO.,

Cor. Wyandotte St. and Railroad,
DAYTON, O.,

MANUFACTURERS OF

LEVER, COMPOUND LEVER, AND Screw Jacks.

We make 27 varieties of these Jacks, and have more in process of construction.

Send for Illustrated Catalogue and Price List.

Several thousand of them are at work on the E. & T. H., C. & E. L., C., R. I. & P., T. H. & I., C., T. & M. C., St. P., M. & M., N. L., B. & M., Fitchburg, N. Y., P. & O., H. & C. W., Conn. R., C. V., N. Y. O. & W., N. Y., W. S. & B., G. T. E., N. Y., N. H. & H., N. Y. C. & H. R. R., N. Y. & N. E., N. Y., L. E. & W., D. & N., Naugatuck & Housatonic Railroads. Nine of these roads have adopted it for their freight cars. Trial lots may be had without royalty. Office of the Company, 236 La Salle Street, opposite of western entrance to Grand Pacific Hotel.

G. W. DORMAN, Secretary, W. V. PERRY, Gen'l Agt.

IMPROVED HOISTING ENGINES,

MANUFACTURED BY THE

LIDGERWOOD MFG. CO.

OFFICE AND SALESROOMS,

96 Liberty Street, New York.

G. S. WORMER & SONS, Agents,

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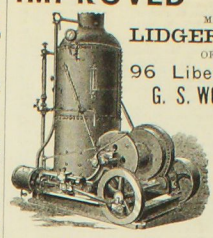
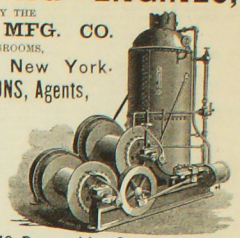


Over 150 different sizes and styles for ALL PURPOSES.

Also

MINING ENGINES,



J. H. HOUGHTON, Eastern Agent, 178 Devonshire Street, Boston.

WM. SELLERS & CO., PHILADELPHIA,

MANUFACTURERS

MACHINE TOOLS AND TWEDDLE'S HYDRAULIC RIVETER.

THE 1876 INJECTOR BOILER-FEEDER

SIMPLE, RELIABLE AND EFFECTIVE.

Started, Regulated and Stopped by one Motion of a Lever.

Branch Office, 79 Liberty Street, NEW YORK.

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UNION CHAIN WORKS

REITER & CO.,

MANUFACTURERS OF ALL KINDS OF CHAINS

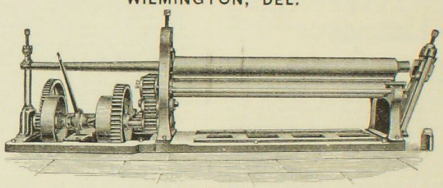
BRAKE CHAIN A SPECIALTY.

P. O. Box 220, Pittsburgh, Pa.

PATENT PLATE BENDING ROLLS.

Built by HILLES & JONES.

WILMINGTON, DEL.



DESCRIPTION.

The annexed cut represents all sizes we make to be driven by belt. It will be seen at once that it is but the work of a moment to balance the top roll and lower the hinge housing, to take out the plate when a full circle is bent. The rolls are all made of Solid Wrought Iron, the Balance Bar being a part or extension of the top roll. There is a Cast-Iron Bed-Plate under the entire machine. To save any shifting of belts we put in Friction Pulleys, which enable the rolls to be started, stopped or reversed instantly.

WILLIAM A. HARRIS,

(ESTABLISHED 1864),

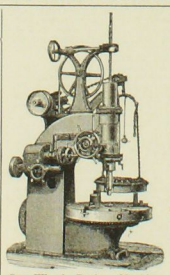
MANUFACTURER OF

HARRIS-CORLISS STEAM ENGINES

With Harris' Patented Improvements,

ALSO HEAVY AND LIGHT IRON AND BRASS CASTINGS

PROVIDENCE R. I.



Car Wheel Boring Machine. Awarded GOLD MEDAL.

THE MACHINE TOOL WORKS.

FREDERICK B. MILES.

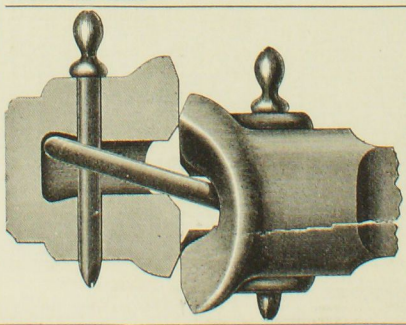
(Formerly FERRIS & MILES.)

TWENTY-FOURTH and WOOD STREETS, PHILADELPHIA, PA.

SEVEN PRIZE MEDALS. CHICAGO EXPOSITION, 1883,

FOR THE BEST

AXLE TURNING MACHINERY,
CAR WHEEL BORING AND TURNING MACHINE,
HYDRAULIC WHEEL PRESS,
IRON PLANING MACHINE,
RADIAL DRILLING MACHINE,
SLOTTING MACHINE,
STEAM HAMMER.



SAFFORD'S SAFETY DRAW-BAR.

"VICTORY OVER MORE THAN 30 CONTESTANTS."

Victory over more than 30 Self-Couplers in the Master Car-Builder's Convention of June, 1876. Also indorsement for safety in coupling by the Yard Masters, in their Convention, June, 1877, and by 300 others who were unable to attend the Convention, and 300 railroad officials who are resident in 26 States, and who admitted superiority over any other yet produced. Try 30 free of royalty, and see for yourself! Pattern free, and no change in timbers or connections. Those made by Wilson, Walker & Co., Pittsburgh, Pa., *will save 200 per cent. in repairs*, and give double life service over *old styles of* wrought iron. About 43,000 in use by 146 railroads. The *saving in repairs* by using *my invention* is from 20 per cent. to 80 per cent. as per *report of many officers.*

J. B. SAFFORD,

EAGLE IRON WORKS

BUFFALO, N. Y.

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AUTOMATIC FREIGHT CAR BRAKES AND STEAM DRIVER AND TENDER BRAKES,

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S. W. McMUNN, Supt.
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We offer to Railway Companies the only Exclusively Independent Self Acting Freight Train Brake which has yet been adopted by any Railway in the World. Our Steam Driver and Tender Brake is acknowledged to be the Cheapest, Simplest and BEST Power Brake now in use. Is now used by over 50 different Railroads. We are willing to furnish any railroad company one or more sets of our Steam Driver and Tender Brake upon approbation of 60 or 90 days, to be returned at our expense if not satisfactory.

North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *Supt*.....Raleigh, N. C.
W. H. Turrentine, *M. M.* Comp'y's Shops, N. C.
J. C. Holk, *For. Car Sh.* Comp'y's Shop, N. C.
Atlan...& Char. Air Line. 5 g. 280m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 37 c.
J. Y. Sage, *Supt*.....Atlanta, Ga.
W. A. Walden, *M. M.*.....Atlanta, Ga.
Z. T. Smith, *For. Car Sh.*.....Atlanta, Ge.
(2 Charlotte, Col.& Aug. R. R. 3g. 239 m. 22 lo. 387 c.
G. R. Talcott, *Supt*.....Columbia, S. C.
J. H. Green, *M. M.* (3 roads).. Columbia, S. C.
J. H. Perkins, *For. Car Sh.*.. Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 207 m. 22 l. 218 c.
J. W. Fry, *Supt*.....Columbia, S. C.
J. O. Meredith, *For. E.& C. Rep.* do.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 651 c.
W. M. S. Dunn, *Eng. & Supt.*Alexandria, Va.
J. E. Waddey, *M. of M.*.....Alexandria, Va.
J. T. Nalls, *M. C. B.*.....Alexandria, Va.
Richmond & Petersburg R.R. 4-8½ g. 35 m. 8 lo. 130 c.
J. R. Kenly, *Supt*.....Richmond, Va.
John O'Brien, *M. M.*.....Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 30 cars.
M. J. Gomila, *Rec. & Gen. Man.*Brownsville, Tex.
G. W. Rendall, *M. M.*.....Brownsville, Tex.
M. Markwood, *M. C. B.*.....Brownsville, Tex.
Rochester & Pittsb'g. R.R. 4-8½ g. 134 m. 11 lo. 612 c
Geo. E. Merchant, *Gen. Man.*..Rochester N. Y.
J. F. Hovey, *M. M.*.....Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 12 lo. 357 c.
R. R. Cable, *V. P. & Gen. Supt.*.Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, *Supt. & P. A.* do.
Joseph Elder, *M. M.*.....Peoria, Ill.
R. I. & M. C. Rd.: R. T. Cable, *Supt.*R'k Island, Ill.
J. H. Parks, *M. M.*.....Rock Island, Ill.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 15 cars.
Eben Hillyer. *Supt*.....Rome, Ga.
O. W. Harbin, *M. M. & C. B.*.....Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 409 m. 31 lo. 1,400 cars.
H. M. Britton, *Gen. Man. & P. A.*Oswego, N. Y.
Geo. H. Haselton, *M. M. & C. B.*..Oswego, N. Y.
Eastern Div.:
J. D. Remington, *A. Supt*.....Watertown, N. Y.
Western Div.:
W. H. Chauncey, *A. Supt*.....Oswego, N. Y.
Rumford Falls & Buckfield R.R. 4-8½ g. 29 m. 21 4.2 c.
L. L. Lincoln, *Supt*.....Canton, Me.
O. Spaulding, *Pur. Agt*.....Buckfield, Me.
E. R. Oldham, *M. M.*.....Buckfield, Me.

S

Sabine & East Texas Ry. 4-8½ g. 104 m. 5 lo. 333 c.
R., H. Cousins, *Gen. Supt*.....Beaumont, Tex.
W. A. Meagher, *M. M.*.....Beaumont, Tex.
Sacramento & Placerville R. R. 4-8½ g. 40 m. 3 lo. 68 c.
J. B. Wright, *Supt. & P. A.*...Sacramento, Cal.
A. J. Stevens *M. M.*.....Sacramento, Cal.
Benj. Welch, *M. C. B.*.....Sacramento, Cal.
Saginaw Bay & North'n R. R. 4-8½ g. 30 miles.
J. Jackson, *Gen. Man.*.....Pinconning, Mich.
F. T. Lillico, *Act. Pur. Agt.*..Pinconning, Mich
Edward Keeler, *M. M.*.....Pinconning, Mich.
Saginaw Valley & St. Louis R. R. 4-8½g. 35 m. 41.64 c
N. W. Merrill, *Supt*.....Saginaw, Mich.
Allan Bourn, *Pur. Agt*.....Detroit, Mich.
Geo. C. Watrous, *M. M.*.....Iona, Mich.
San Francisco & No. Pac. 4-8½ g. 112 m. 11 lo. 234 c.
Arthur Hughes, *Gen. Man.*..San Francisco, Cal.
H. C. Whiting, *Supt*.....Petaluma, Cal.
Ed. Reynolds, *Gen. M. M.*.....Donahue, Cal.
Savannah, Florida & W'n Ry. 5 g. 422 m. 50 lo. 695 c.
H. S. Haines, *Gen. Man*.....Savannah, Ga.
S. G. Fleming, *Supt*.....Savannah, Ga.
F. S. Pendergast, *Ch. Eng.*.....Savannah, Ga.
A. A. Aveille, *Pur. Agt*.....Savannah, Ga.
G. M. D. Riley, *M. of Mach.*.....Savannah, Ga.
Jos. W. Rowell, *For. Car Dept*.Savannah, Ga.
Sav., Griffin & No. Ala. R. R. *Op. by Central (Ga.).*
Schuylkill & Lehigh R. R. 4-8½ g. 18 miles.
Eldredge Dale, *Supt*.....Reading, Pa.
Scoharie Valley R. R. *(See Middleburg & Sch.)*
Scioto Valley R. R. 4-8½ g. 151 m. 15 lo. 440 cars.
Geo. Skinner, *Supt*.....Columbus, O
R. Bromley, *M. M. & P. A.*.....Portsmouth, O.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. c.
E. G. Ohio, *Mast. of Trans.*...Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M.*Portsmouth, Va.
Shenandoah Valley R. R. 4-8½ g. 143 m. 15 lo. 104 c.
J. H. Sands, *Supt*.....Roanoke, Va.
W. C. De Armond, *Pur. Agt*. Philadelphia, Pa.
Chas. Blackwell, *Supt. of Mach.*.Roanoke, Va.
W. Welch, *M. M.*.....Roanoke, Va.
Shenango & Allegheny R.R 4-8½ g. 47 m. 6 lo. 156 c.
J. T. Blair, *G. Supt. & Pur. Agt.*Greenville, Pa.
Edw. Richardson, *M. M. & C. B.*Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 27 cars.
Edwin McNeill, *Supt*.....Litchfield, Ct.
C. M. Allen. *M. M.*.....Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 25 cars.
C. L. Harris, *Supt. & Pur. Agt.*..Ripley, Miss.
W. H. Phelps, *M. M.*.....Ripley, Miss.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 21 lo. 504 c.
P. E. Hall, *Gen. Man. & P. A.*Cedar Rapids, Ia.
C. M. Lawler, *Gen. Supt*.....Missouri Valley, Ia.
J. S. Watties, *Supt*.....Missouri Valley, Ia.
C. F. McCoy, *Asst. Supt*.....Blair, Neb.
S. A. Teal, *M. M.*.....Missouri Valley, Ia.
W. H. Ramseyer, *M. C.B.*..Missouri Valley, Ia.
Sodus Bay & Southern Ry. 4-8½ g. 34 m. 4 lo. 40 c.
S. B. Stuart, *Supt. & Pur. Agt*.Sodus Point, N. Y.
C. H. Hill, *M. C. B.*.....Sodus Point, N. Y.
South Carolina Ry. 5 g. 243 m. 42 lo. 685 cars.
John B. Peck, *Gen. Man.*.....Charleston, S. C.
S. B. Pickens, *Pur. Agt*.....Charleston, S. C.
P. J. Cochrane, *Mast. of Mach.*.Charleston, S. C.
Geo. H. Graniling, *M. C. B.*.....Charleston, S. C.
South-Eastern Ry. 4-8½ g. 266 m. 26 lo. 836 cars.
T. A. McKinnon, *Gen. Man.*.....Montreal, Can.
H. A. Allen, *Supt*.....W. Farnham, P. Q.
D. Eastman, *M. M.*.....W. Farnham, P. Q.
South Florida R. R. 3 gauge 40 m. 4 lo. 20 cars
B. R. Swoope, *Supt. & P. A.*.....Sanford, Fla.
C. C. Haskell, *Pur. Agt*.....Sanford, Fla.
J. A. Campbell, *M. M.*.....Sanford, Fla.
A. D. Stentiford, *M. C. B.*.....Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c
W. H. Woodward, *Supt*. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 10 lo. 260 cars.
A. Hoffacker, *Gen. Supt*. San Francisco, Cal.
G. H. Waggoner *Pur. Agt*.. San Francisco, Cal.
E. L. Reese, *M. M. & C. B.*.....Newark, Cal.
South-Western R. R. (Ga.) *(See Central R. (Ga.)*
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, *Supt*.....Harrodsburg, Ky.
J. Tomlinson, *Pur. Agt*.....Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 115 m. 16 lo. 447 c.
James G. Knapp, *Supt. & Pur. Agt.*Auburn, N. Y.
Chas. G. Brown, *M. M.*.....Auburn, N. Y.
H. Mooney, *M. C. B.*.....Auburn. N. Y.
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 5 c.
Robert Knight, *Supt*.....Brandywine, Md.
C. R. Joyce, *M. M.*.....Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 108 m. 30 lo. 728 c.
Northern Div. *(For other Divs. see Cen. Pac.)*
A. C. Bassett, *Supt*.....San Francisco, Cal.
J. R. Watson, *Pur. Agt*.....Sacramento, Cal.
J. T. Wilson, *M. M.*.....San Francisco, Cal.
F. N. Bellsle, *M. C. B.*.....San Francisco, Cal.
Spring Hill & Parrsboro Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, *Gen. Man.*.....Parrsboro, N. S.
K. McKinnon, *M. M.*.....Parrsboro, N. S.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, *Supt. & Pur. Agt*. Calais, Me.
G. H. Corsen, *M. M.*.....Milltown, Me.
H. C. Tincker, *M. C. B.*.....Milltown, Me.
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin. *Pr. & Supt*. Jacksonville, Fla.
Geo. Ferro, *M. of Mach.*.....Tocoi, Fla.
St. Johnsb'y & Lake Champ. 4-8½ g. 120 m. 10 lo. 357 c.
A. B. Jewett, *Supt. & P. A.*.St. Johnsbury, Vt.
Geo. E. Howe, *M. M. & C. B.*St. Johnsbury, Vt.
St. Joseph & Des Moines R. R. *(See K. C., St. J. & C. B.)*
St. Lawrence & Ottawa Ry. 4-8½ g. 59 m. 10 l. 146 c.
Archer Baker, *Gen. Supt*.....Montreal, Ont.
R. Blackwell, *Mech. Supt*.....Montreal, Ont.
St. Louis, Alton & Terre Haute R. R.
Main Line. *(See Ind. & St. L. Div.; Ohio Riv.)*
St. Louis & Cairo Div. 4-8½ g. 137 m. 17 lo. 778 c.
G. W. Parker, *Gen. Man*.....St. Louis, Mo.
J. L. Hinckley, *Supt*.....Belleville, Ill.
A. M. De Clerque, *M. M.*.....St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 27 m. 18 lo. 11 cars.
Wm. Taussig, *Gen. Man.*.....St. Louis, Mo.
A. W. Dickinson, *Supt*.....St. Louis, Mo.
J. E. Williams, *Jr., Pur. Agt*.....St. Louis, Mo.
H. M. Smith, *M. M.*.....St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 28 m. 1 lo. 78 cars.
Jas. Prentice, *Supt*.....Cbondale, Ill.
Jas. C. Bryden, *Pur. Agt*.....St. Louis, Mo.
St. Louis, Ft. Scott & Wichita R.R. 4-8½ g. 128 miles.
F. Tiernan, *V. P. & Gen. Man.*.Fort Scott, Kan.
J. W. Miller, *Gen. Supt*.....Fort Scott, Kan.
Henry Berger, *M. M.*.....Ft. Scott, Kan.
A. A. Tiddell, *M. C. B.*.....Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 85 m. 5 lo. 65 c.
W. W. Walker, *Gen. Supt*.....Hannibal, Mo.
Geo. Douglass, *Pur. Agt*.....Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. *(See Mo. Pacific Ry.)*
St. L. Keokuk & No.-W'n. 4-8½ g. 187 m. 14 lo. 312 c.
R. Law, *Gen. Supt*.....Keokuk, Ia.
G. B. Harris, *Pur. Agt*.....Chicago, Ill.
Wm. H. Bartlett, *M. M.*.....Keokuk, Ia.
St. L., Salem & Little Rock. 4-9 g. 69 m. 5 lo. 103 c
H. A. Crawford, *V. Pr. & P. A.*..St. Louis, Mo.
E. B. Sankey, *Supt*.....Salem, Mo.
Thomas Everson, *M. M.*.....Steelville, Mo.
J. W. Houston, *M. C. B.*.....Steelville, Mo.
St. L. Van & T. H. *(See T. H. & I. Div. of Penna. Co.)*
St. Louis & Cairo R. R. 3 g. 162 m. 22 lo. 886 cars.
Chas. Hamilton, *Gen. Supt*.....St. Louis. Mo.
R. M. Pringle, *M. M.*.....St. Louis, Mo.
St. L. & San Fran. Ry. 4-8½ g. 854 m. 80 lo. 2,700 c.
C. W. Rogers, *V. P. & Gen. Man.*St. Louis, Mo.
D. H. Nichols, *Mast. Trans.*..No. Springfield, Mo.
A. G. Thompson, *Pur. Agt*.....St. Louis, Mo.
M. Kearney, *M. M. & C. B.*..No. Springfield, Mo.
Mo. & Ark. Div.: W. A. Thoms, *Supt*.....do.
Kan. Div.: J. R. Wentworth, *Supt*.Neodesha, Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, *Manager*.....St. Martin s, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4-8½ g. 1,125 m. 168 lo. 4,331 cars.
A. Manvel, *Gen. Man.*.....St. Paul, Minn.
E. B. Wakeman, *Asst. Gen. Supt.*St. Paul, Minn.
J. C. Morrison, *Pur. Agt*.....St. Paul, Minn.
H. Middleton, *M. M. & C. B.*.....St. Paul, Minn.
Breck. Trask, *Cor. Sec. & Outfitter, Supt*.....St. Paul, Minn.
F. F. Div.: J. B. Race, *Supt*.....St. Paul, Minn.
No'n Div.: D. K. Smith, *Supt*.....Brookston, Minn.
St. Paul & Duluth R. R. 4-8½ g. 196 m. 24 lo. 580 c
H. P. Breed, *Asst. Gen. Supt*.....St. Paul, Minn.
J. G. Callahan, *Pur. Agt*.....St. Paul, Minn.
W. McFarland, *M. M.*.....St. Paul, Minn.
John Hill, *M. C. B.*.....St. Paul, Minn.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 15 cars.
J. J. Mosher, *Supt*.....Sloatsburg, N. Y.
Syracuse, Binghamton & N. Y. R. R. *(See D. L. & W.)*
Syracuse, Chenango & N. Y. 4-8½ g. 80 m. 41 lo. 90 c
Albert Allen, *Supt*.....Syracuse, N. Y.
George W. West, *M. M.*.....Syracuse, N. Y.
Geo. J. McMichael, *M. C. B.*.....Syracuse, N. Y.
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4-8½ g. 121 m. 28 lo. 1,044 c.
A. H. Cotton, *Supt*.....Corning, N. Y.
W. E. Gorton, *Asst. Supt*.....Corning, N. Y.
Andrew Beers, *Pur. Agt*.....Corning, N. Y.
O. C. Patchell, *M. M.*.....Corning, N. Y.
C. J. Butler, *M. C. B.*.....Corning, N. Y.

T

Terre Haute & So.-Eastern Ry. 4-9 g. 40 miles.
Geo. Atherton, *Supt*.....Terre Haute, Ind.
Texas-Mexican and Mexican National Rys.
3 g. 333. 28 lo. 600 cars.
G. C. Gardner, *Gen. Man*.....New York, N. Y.
W. E. Lewis, *Supt*.....Mexico, Mex.
J. Dougherty, *Pur. Agt*.....New York, N. Y.
No. Div.: F. A. Lister *G. M.* Corpus Christi, Tex.
P. J. Milan, *M. M. & C. B.*.....do.
Mex. Nat. Ry.: J. M. Winslow, *M. M.*.Mexico, Mex.
Jno. Scullen, *Gen. Man*.....Mexico, Mex.
Texas Western Ry. 3 g. 42 m. 2 lo. 34 cars.
E. L. Heriot, *Gen. Man.*.....Houston, Tex.
J. W. Goodwin, *Supt*.....Houston, Tex.
T. F. Glispin, *M. M.*.....Houston, Tex.
Texas & New Orleans; Louisiana W'n R. Rs.
4-8½ g. 217 m. 25 lo. 900 c.
A. N. Towne, *Gen. Man.*.....Houston, Tex.
P. B. Watson, *Pur. Agt*.....Houston, Tex.
C. A. Burton, *Supt*.....Houston, Tex.
D. C. Smith, *M. M.*.....Houston, Tex.
J. M. Mather, *M. C. B.*.....Houston, Tex.
Texas Pacific. *(See Mo. Pac. Ry.)*
Texas & St. Louis Ry. 3 g. 304 m. 19 lo. 338 cars.
G. W. Bistine, *Gen. Man*.....St. Louis, Mo.
A. L. Horne, *Supt*.....Tyler, Tex.
A. S. Horner, *Supt*.....Texarkana, Kan.
F. W. Paramore, *Pur. Agt*.....St. Louis. Mo.
L. B. Fish, *Pur. Agt*.....Tyler, Texas.
G. W. Prescott, *S. M. P. & M.*...St. Louis, Mo.
Tioga and Elmira State Line R. Rs.
4-8½ g. and 5 g. 54 m. 17 lo. 953 cars.
L. H. Shattuck, *Supt*.....Blossburg, Pa.
J. A. Hardenburg, *Pur. Agt*.. New York, N. Y.
Pere Bonny, *M. M.*.....Blossburg, Pa.
D. H. Stratton, *M. C. B.*.....Blossburg, Pa.
Toledo, Ann Ar. & Gr. Tr. Ry. 4-8½ g. 84 m. 9 lo. 150 c.
J. M. Ashley, *Gen. Man*.....Ann Arbor, Mich.
H. W. Ashley, *Supt. & Pur. Agt*.....do
C. C. Dodge, *M. M.*.....Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 465 m. 63 lo. 2,200 c.
E. E. Dwight, *Gen. Man*.....Toledo, O.
F. W. Stewart, *P. A.*.....Toledo, O.
L. James, *Supt. Mach*.....Toledo, O.
Tho. Robertson, *M. M.*.....Delphos, O
Toledo Div.: W. H. Vandergrift, *Supt.*; and
J. G. Clifford, *M. M.*.....Delphos, O.
C. H. Mead, *Gen. M. C. B.*.....Delphos, O.
Del. & Cin. Divs.: D. T. Bacon, *Supt*.....Cin., O.
L. Parisen, *M. M.*.....Dayton, O.
St. Louis Div.: M. B. Mann.....Charleston, Ill.
So. Ea'n Div.: A. W. Salter.....Dayton, O.
Tonawanda Valley & Cuba R. R. 3 g. 60 m. 6 l. 30 c.
B. C. Williams, *Gen. Man. & P. A.*Bradford, Pa
Jno. Delaney, *M. M. & C. B.*.....tradford, Pa.
Toronto, Grey & Bruce Ry. 4-8½ g. 101 m. 20 lo. 440 c.
Edmund Wragge, *Gen. Man*.....Toronto, Can.
W. Watson, *Pur. Agt*.....Toronto, Can.
David Preston, *M. M.*.....Toronto, Can.
Troy & Boston R. R. 4-8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, *Pres. & Pur. Agt*.....Troy, N. Y.
Joseph Cardell, *Supt*.....Troy, N. Y.
Z. B. Davis, *M. M.*.....Troy, N. Y.
R. V. Coon, *M. C. B.*.....Troy, N. Y.
Tuckerton R. R. 4-8½ g. 31 m. 2 lo. 28 cars.
J. J. Pharo, *Supt*.....Tuckerton N. J.

U

Ulster & Delaware R. R. 4-8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt*.....Rondout, N. Y.
Joseph Rush, *M. M.*.....Rondout, N. Y.
John H. Decker, *M. C. B.*.....Rondout, N. Y.
Union Pacific Ry. (5 Gen. Divs.)
3 & 4-8½ g. 4,286 m. 510 lo. 10,550 cars.
S. H. H. Clark, *Gen. Man.*.....Omaha, Neb.
Thos. L. Kimball, *Asst. Gen. Man.*Omaha, Neb.
M. H. Gobie, *Pur. Agt*.....Omaha, Neb.
I. H. Coupland, *S. M. P. & C. D.*..Omaha, Neb.
John Wilson, *Asst. do*.....Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, *Gen. Supt.*..Omaha, Neb.
E. Div.: C. B. Havens, *Supt*.....Omaha, Neb.
R. McConnell, *M. M.*.....Omaha, Neb.
A. M. Collett, *M. C. B.*.....Omaha, Neb.
St. J. & W. Div.: L. D. Tuthill, *Supt.*St. Joseph, Mo.
E. Sleppy, *M. M.*.....G. Island, Neb.
Moun. Div.: W. A. Deuel, *Supt*.. Cheyenne, W. T
J. H. McConnell, *M. M.*.....N. Platte, Neb.
R. McDougall, *M. M.*.....Cheyenne, W. T.
(2) Wy. Div.: E. Dickenson, *Gen. Supt.*..Laramie, W. T.
Laramie Div.: E. Dickenson, *Gen. Supt.* do.
T. E. Lewis, *M. M.*.....Laramie, W. T.
T. A. Davis, *M. M.*.....Rawlins, W. T.
Wes. Div.: C. E. Wurtelle, *Supt*. Evanston, W. T.
Geo. F. Chapman, *M. M.*.....Evanston, W. T.
(3) Idaho Div.: W. B. Doddridge, *Gen. Supt.*Ogden, U.
Og. S. L. Div.:
R. Blickensderfer, *Supt*.....Pocatello, Id.
W. H. Lewis, *M. M.*.....Montpellier, Id.
S. L. & W. Div.:
W. W. Ritter, *Supt*.....S. Lake City, Utah
U. & N. Div.:
R. Blickensdorfer, *Supt*.....Pocatello, Id.
R. Croft, *M. M.*.....Logan, Utah.
F. Reardon, *M. M.*.....Eagle Rock, Id.
(4) Col. Cent. Div.: A. J. Egbert, *Gen. Sup't*.Denver, Col.
C. C. Div.: P. Toughy, *Supt*.....Denver, Col.
F. Meirtsheimer, *M. M.*.....Denver, Col.
So. Park Div.: G. W. Evans, *A. Supt.*Canon, Col.
F. Meir.sueimer, *M. M.*.....Denver, Col.
(5) Kan. Div.: F. P. Smith, *Gen. Supt.*Kansas City, Mo
K. Val. Div.: J. O. Brinkerhoff, *Supt.*Kan. C'y, Mo.
Jas. Mackenzie, *M. M.*.....Armstrong, Kan.
Kan. Cent. Div.:
N. T. Kelley, *Supt*.....Leavenworth, Kan.
Smo. Hill Div.:
O. H. Penrance, *Supt*.....Wallace, Kan.
J. B. Dailey, *M. M.*.....Ellis, Kan.
United States Rolling Stock Co. 23 lo. 4,834 cars.
A. Hegewisch, *Pres.*.....New York, N. Y.
C. P. Laurie, *Gen. M. M.*.....Chicago, Ill.
W. H. Chaddock, *Pur, Agt*.....Chicago, Ill.
Utah Central Ry. 4-8½ g. 51 m. 5 lo. 147 cars.
John Sharp, *Gen. Supt*...Salt Lake City, Utah.
S. H. Hill, *Pur. Agt*.....Salt Lake City, Utah.
W. B. Ramsden, *M. M.*.Salt Lake City, Utah.
Peter Reid, *M. C. B.*.....Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m.
W. W. Ritter, *Gen. Man*...Salt Lake City, Utah.
Robert Anderson, *M. M.*..Salt Lake City, Utah.
Utah & Pleasant Valley Ry. 60 m.
G. M. Young, *Man*.....Salt Lake City, Utah.
Utica, Ithaca & Elmira Ry. 4-8½ g. 120 m. 11 lo. 152 c.
C. R. Fitch, *Supt*.....Elmira, N. Y.
C. J. Hedley, *M. M. & M. C. B.*.Bresspor, Pa.
Utica, & Black Riv. R. R. 4-8½ g. 180 m. 22 lo. 329 c.
J. F. Maynard, *Gen. Man. & P. A.*.Utica, N. Y.
John Bailey, *M. M.*.....Utica, N. Y.
David James, *M. C. B.*.....Utica. N. Y.

V

Vaca Vall. & Clear Lake R. R. 4-8½ g. 30 m. 2 lo. 19 c.
C. F. Stevenson, *Gen. Supt*.....Vacaville, Cal.
Valley Ry. 4-8½ g. 59 m. 10 lo. 317 cars.
J. E. Turk, *Supt. & P. Agt*.....Cleveland, O.
Chas. Blanchard, *M. C. B.*.....Cleveland, O.
Vernon, Greensburg & Rushville R. R. 25 m.
Horace Scott, *V.-Pres.*.....Greensburg, Ind.
Virginia Midland Ry. *(See Rich. & Dan.)*
Virginia & Truckee R. R. 4-8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 158 m. 4 lo. 76 c.
H. M. Yerington, *Gen. Supt*.....Carson, Nev.
R. J. Laws, *Supt*. (C. & Col.).....Carson, Nev.
Hume Yerington, *Pur. Agt*.....Carson, Nev.
H. N. Fording, *M. M.*.....Carson, Nev.
B. F. Lyon, *M. C. B.*.....Carson, Nev.

W

Wabash, Chester & W'n R. R. 4-8½ g. 42 m. 2 lo. 32 c
J. L. Hinckley, *Supt*.....Belleville, Ill
Wabash, St. Louis & Pacific Ry. (3 Gen. Divs.)
4-8½ g. 3,241 m. 508 lo. 17,230 cars.
John C. Gault, *2d V. P.*.....St. Louis, Mo.
Robert Andrews, *Gen. Supt*.....St. Louis, Mo.
R. B. Lyle, *Pur. Agt*.....St. Louis, Mo.
Jacob Ishaam, *Gen. M. M.*.....Springfield, Ill.
U. H. Kohler, *Gen. M. C. B.*.....Toledo, O.
(1) Eas'n Div.: J. B. Barnes, *M. M.*Fort Wayne, Ind.
(2) & (3) Div.: G. W. Stevens, *Supt.*Ft. Wayne, Ind.
Peru Div.: E. C. Murphy, *Supt*.....Peru, Ind.
John McKenna, *M. M.*.....Peru, Ind.
Cairo Div.: W. Buchanan, *Supt.*.....Springfield, Ill.
W. S. Morris, *M. M.*.....Carmi, Ill
(2) Middle Div.: R. M. Hemphill, *M. C. B.*Peoria, Ill.
Ill. Div.: H. P. Clark, *Supt*.....Tyler, Texas.
B. B. Rose, *M. C. B.*.....Decatur, Ill.
Chicago Div.: E. N. Armstrong, *Supt.*Chicago, Ill
Peoria Div.: E. L. Tomkins, *Supt*.....Peoria, Ill.
Rant'l Div.: B. F. Mathias, *Supt*.....Rantoul, Ill.
J. McCarthy, *M. M.*.....Rantoul, Ill.
(3) Western Div.: W. H. Selby, *M. M.*.....Moberly, Mo.
C. S. Buck, *M. C. B.*.....Moberly, Mo.
Missouri Div.: R. S. Miner, *Supt*.....Moberly, Mo.
C. B. & Q. Div.: W. Blanchard, *Supt.*; and
J. S. Hazen, *M. C. B.*.....Stanberry, Mo
Quincy Div.: F. D. Schermerhorn, *S.*, Quincy, Ill
Iowa Div.: E. Presser, *Supt*.....Keokuk, Ia.
D. Moin. Div.: H. B. Skeele, *Supt.* Des Moines, Ia
Walla Walla & Columbia Riv. R. R. *(See Ore. Ry.)*
Walkill Ry. *(See N. Y., West. Sh. & B.*
Washington, Ohio & West. R. R. 4-8½ g. 52 m. 5 lo. 83 c.
S. M. Brophy, *Supt*.....Alexandria Va.
Edward Dunn, *M. M.*.....Alexandria, Va.
John Harrison, *M. C. B.*.....Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 29 m. 3 lo. 29 c.
C. E. Bower, *Supt*.....Waynesburg, Pa.
A. M. Kline, *M. C. B.*.....Waynesburg, Pa.
Welland Ry. 4-8½ g. 25 m. 5 lo. 147 cars.
William Pay, *Supt*.....St. Catharines, Ont.
Jas. Taylor, *M. M.*.....St. Catharines, Ont.
Wm. H. Pay, *M. C. B.*.....St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m.
Rolla Wells, *Supt*.....St. Louis, Mo.
M. M. Hottenman, *M. M.*.....Florissant, Mo.
West Feliciana R. R. 4-8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, *Pr. & Gen. Supt.*Bayou Sara, La.
J. A. Tilton, *M. M. & C. B.*.....Bayou Sara, La.
West Virginia, Central & Pittsb'g Ry. 13 m. 3 lo. 19 c.
W. E. Porter, *Gen. Supt*.....Piedmont, W. Va.
Geo. W. Harrison, *Pur. Agt*..Piedmont, W. Va.
E. W. Lippencott, *M. M. & M. C. B.*.Piedmont.
Western R. R. (of Ala.) 5 g. 88 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5g. 87 m. 14 lo. 200 c.
Cecil Gabbett, *Gen. Man. & Supt.*..Mont., Ala.
C. D. Wall, *M. M.*.....Montgomery, Ala.
F. M. Wade, *M. C. B.*.....Montgomery, Ala.
Western Counties' Ry. 4-8½ g. 67 m. 8 lo. 157 cars.
J. Brignell, *Supt*.....Yarmouth, N. S.
Western Maryland R. R. 4-8½ g. 157 m. 16 lo. 394 c.
J. M. Hood. *Pr. & Gen. Man.*...Baltimore, Md.
R. J. Adair, *Pur. Agt*.....Baltimore, Md.
David Holtz, *Mast. of Mach.*.Union Bridge, Md.
J. H. Nussear, *M. C. B.*.....Union Bridge, Md.
Western No. Carolina R. R. 5 g. 150 m. 6 lo. 90 c.
V. E. McBee, *Supt*.....Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt*.....Richmond, Va.
G. W. Gates, *M. M.*.....Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 48 lo. 953 c.
R. A. Anderson, *Gen. Supt*.....Atlanta, Ga.
A. B. Bostwick, *Asst. Supt*.....Atlanta, Ga.
Pur. Agt.....Atlanta, Ga.
John H. Flynn, *M. M. & C. B.*....Atlanta, Ga
Wheeling & Lake Erie R. R. 108 miles.
M. D. Woodford, *Gen. Man*.....Toledo, O.
O. P. Dunbar, *Gen. M. M.*.....Norwalk, O.
John Hillhouse, *Dir. M. M.*.....Norwalk, O.
White Water R. R. *(See Ft. W., Cin. & Lou.)*
Wilmington & No'n R. R. 4-8½ g. 77 m. 13 lo. 148 c.
J. H. Thompson, *Supt. & P. A.*.Coatesville, Pa.
George Rommel, *M. M.*.....Coatesville, Pa.
Alex. Maitland, *M. C. B.*.....Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs.
5 g. 566 miles 70 locomotives 1,128 cars.
R. R. Bridgers, *Gen. Man.*.....Wilmington, N. C.
J. F. Divine, *Gen. Supt*.....Wilmington, N. C.
John Bissel, *M. M.*.....Wilmington, N. C.
W. H. Day, *M. C. B.*.....Florence, S. C.
C. R. Clowe, *M. C. B.* (W. & W.).Wilmington, N. C.
Windsor & Annapolis Ry. 4-8½ g. 130 m. 10 lo. 156 c.
P. Innes, *Gen. Man*.....Kentville, N. S.
Wm. Yould, *M. M.*.....Kentville, N. S.
Wm. Grierson, *M. C. B.*.....Kentville, N. S.
Wisconsin Central R. R. 4-8½ g. 480 m. 49 lo. 1,608 c.
F. N. Finney, *Gen. Man*.....Milwaukee, Wis.
E. K. Howes, *Pur. Agt*.....Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M.*..Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, *S.*..Milwaukee, Wis.
Wis., Minn. & St. M. & N. Div.:
W. E. Carroll, *Supt*.....Stevens Point, Wis.
Worcester & Nashua; and Nashua & Rochester R.Rs.
4-8½ g. 103 m. 20 lo. 505 cars.
C. S. Turner, *Pres. & G. Man.*Worcester, Mass.
G. W. Hurlburt, *Supt*.....Worcester, Mass.
John G. Brady, *M. M. & C. B.*.....Worcester, Mass.
Worcester & Shrewsbury R. R. 3 g. 3 miles.
Worcester & Somerset R. R. 4-8½ g. 10 m. 1 lo. 4 c.
J. J. Cohuna, *Supt*.....Worcester, Mass.
G. E. Hapgood, *Pur. Agt*.....Worcester, Mass.
Chas. Cleveland, *M. M.*.....Worcester, Mass.

Y

York & Peach Bottom Ry. 3 g. 39 m. 4 lo. 62 c.
S. M. Manifold, *Supt. & Pur. Agt*.....York, Pa.
S. J. Williams, *M. M.*.....York, Pa.
Youghiogheny R. R. 4-9 gauge
Wm. Wilson, *Supt*.....Irwin's, Pa.

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This Hand-Car is especially adapted to the use of **Road-Masters, Bridge Inspectors, Telegraph Line Repairers, Track Inspectors, Track Walkers, Wood and Tie Inspectors,** and for all work where one or two men wish to go over the line at will. Also, our Telegraph Cars, capable of carrying two men and material. Light, Easily Handled, and when ready for shipment occupy very little space in Baggage Car—a great advantage to railroad men. Run easily, being propelled by the **ROWING MOVEMENT.** Can be run short distances at the rate of **20 Miles an Hour and with not Jump the Track.**

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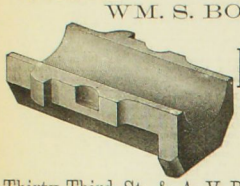

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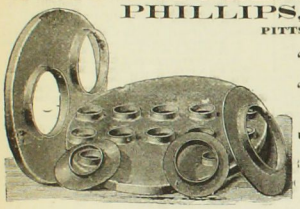

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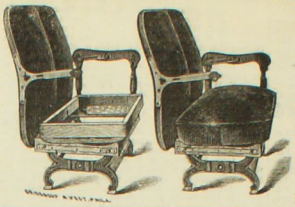

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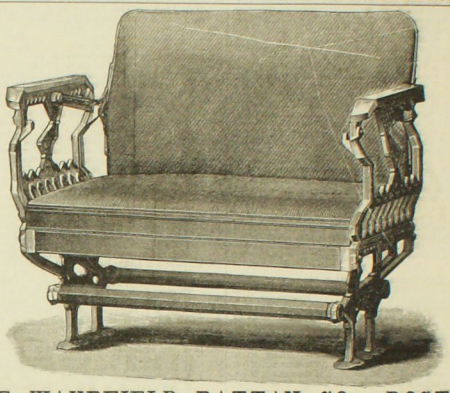

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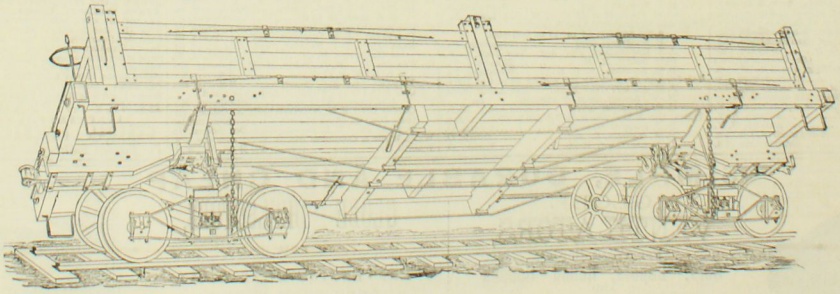

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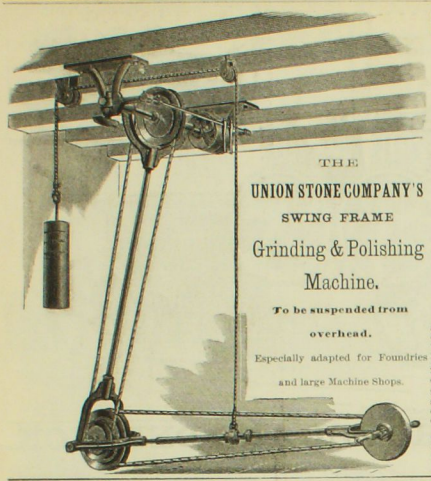

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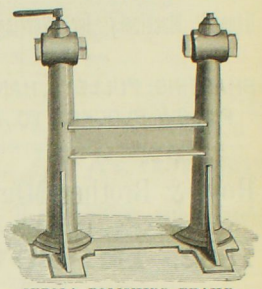

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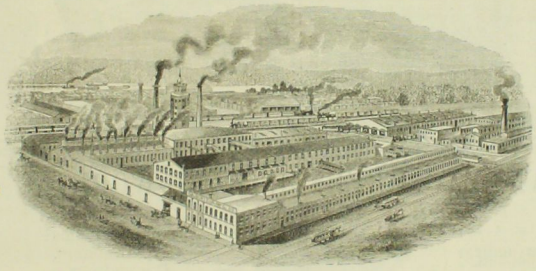

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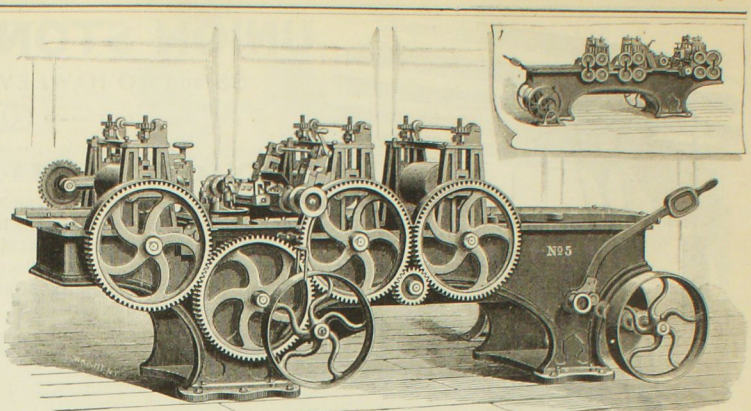

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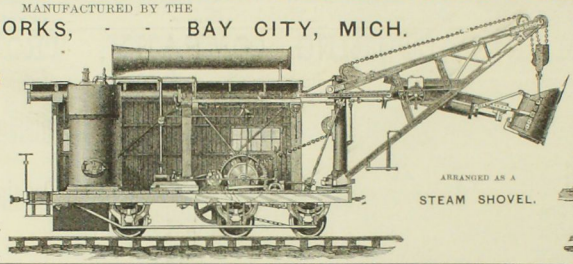

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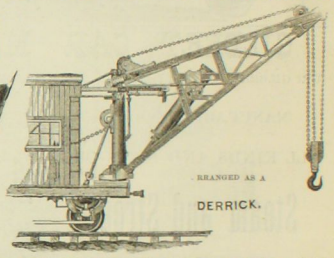

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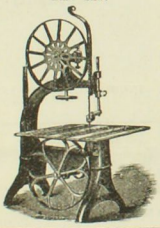

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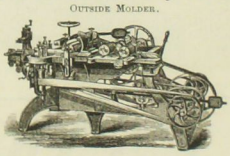

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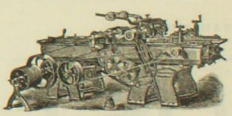

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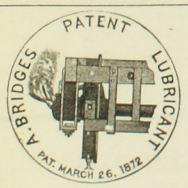

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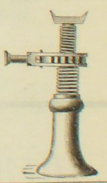

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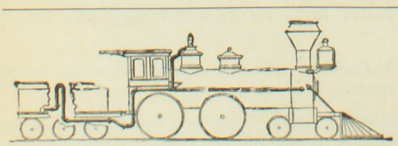

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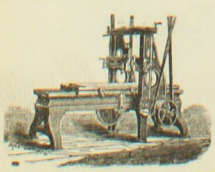

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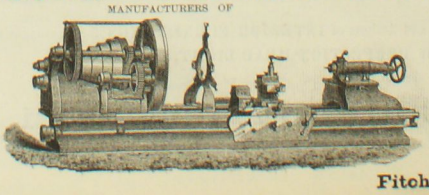

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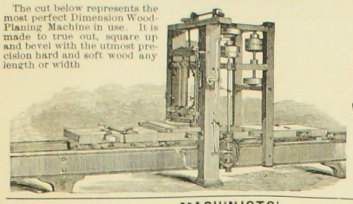

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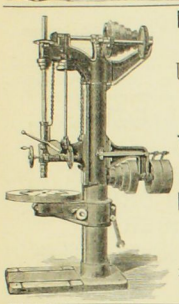

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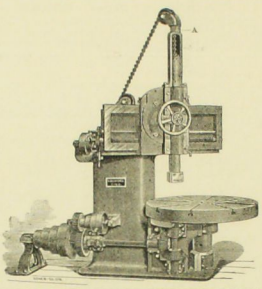

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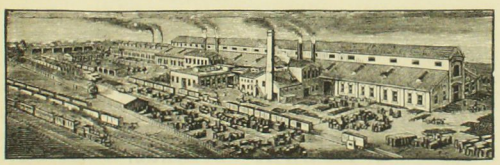

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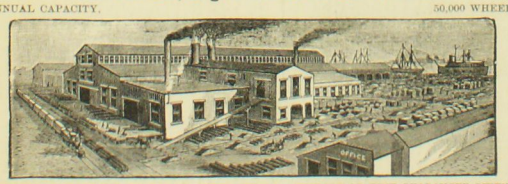

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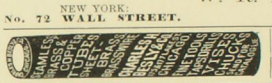

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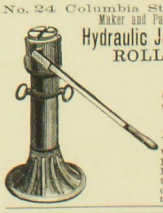

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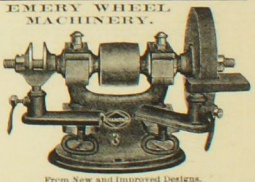

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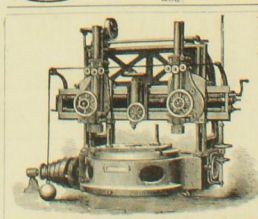

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